A CHILTON PUBLICATION

the Iron Age

NATIONAL METALWORKING WEEKLY

November 5, 1953

OF MICHIGAN
NOV 6 1953
EAST ENGINEERING

NTS PAGE 2

Simplified design—protection from dirt and wear—low maintenance costs—are but a few of the advantages resulting from the use of New Department Sealed Ball Bearings. It's no wonder so many motor and machinery manufacturers use N-D-Seal Bearings. Since New Departure originated the first self-sealed ball bearing more than 255,000,000 have been produced.

Why not let a New Departure engineer show you what New Departure sealed bearings can do for your product.

NOTHING ROLLS LIKE A BALL

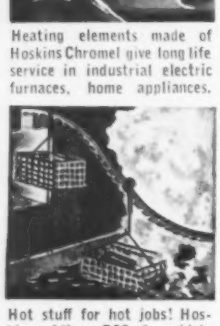
NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Plants also in Meriden, Connecticut, and Sandusky, Ohio

How long will this valve last?

Hoskins Chromel-Alumel thermocouple alloys accurately register exhaust temperatures of jet aircraft engines.

Heating elements made of Hoskins Chromel give long life service in industrial electric furnaces, home appliances.



Hot stuff for hot jobs! Hoskins Alloy 502 is widely used by industry for many heat resistant mechanical applications.

You're looking in on a life-saving operation . . . one that's being performed on an engine valve. Not an ordinary valve for an ordinary engine. But a valve destined for long, hard service in an aircraft, tank, or heavy-duty truck engine. A valve that must be made to stand up under extremely severe operating conditions . . . high temperatures, for long periods of time, plus the destructive corrosive action of hot exhaust gases.

And what's responsible for long valve life under such gruelling conditions? Nothing less than Hoskins Alloy 717 . . . a closely controlled nickel-chromium composition developed especially for just such tough and vital service. It's highly resistant to heat . . . immune to the corrosive atmospheres created by combustion of high octane fuels. What's more, it's readily applied by fusion to form a non-porous protective facing over the basic valve forging.

But 717 is only one of several specialized nickel-chromium alloys developed and produced by Hoskins. Among the others: Alloy 502 . . . known throughout industry for its dependability on a wide range of heat resistant mechanical applications. The Chromel-Alumel thermocouple alloys . . . unconditionally guaranteed to register true temperature—E.M.F. values within specified close limits. Spark plug electrode alloys which have become universally accepted standards of quality and durability. And, of course, there's Hoskins CHROMEL . . . the *original* nickel-chromium resistance alloy, used as heating elements and cold resistors in countless different products.

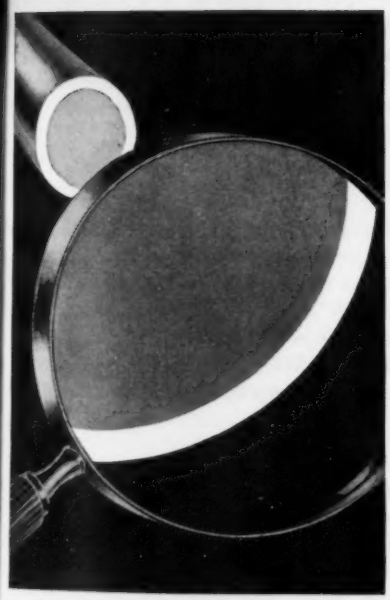
HOSKINS

MANUFACTURING COMPANY

4445 LAWTON AVENUE, DETROIT 8, MICHIGAN

Chromel NICKEL CHROMIUM WIRE

What makes it hold so tight?



The ductile coating of zinc on bethanized wire is undamaged, even when the wire is wrapped around its own diameter.

Bend a piece of bethanized wire, twist it, wrap it around its own diameter—even draw it to fine gauge—and the zinc coating stays put, without cracking, flaking or peeling off.

What makes the bethanized zinc coating hold to the steel wire so tenaciously? The unique electrolytic bethanizing process deposits virgin zinc on an electrolytically cleaned steel surface. The result is a zinc coating of high purity and exceptional ductility. It's integrally bonded to the steel base, proving that it is not necessary to have an iron-zinc alloy layer as a bonding agent.

Besides withstanding severe forming or fabricating operations, bethanized coatings are available in weights to fit your particular requirements. For example, we can supply a coating thickness much heavier than conventional galvanized coatings.

The two great advantages of the bethanized coating—its ability to withstand severe forming and fight off corrosion—make bethanized the ideal zinc-coated wire for many uses. Perhaps it may be the answer to one of your problems. A letter or phone call to the nearest Bethlehem sales office will bring you full information promptly.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHANIZED WIRE

The Iron Age

Vol. 172, No. 19, November 5, 1953

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DIGEST of the

NEWS DEVELOPMENTS

GREAT LAKES BEATS EXPANSION TIMETABLE — P.

Great Lakes Steel Corp. will hit 4 million tons of got capacity on Dec. 1—a month ahead of sched Finishing capacity will be 2 million tons of cold-ro and 1 million tons of hot-rolled products a year. A advantage of the new ingot capacity is that it eliminate need for conversion steel.

DELAY DELAWARE RIVER CHANNEL DREDGING — P.

Corps of Engineers has revised its earlier report reco mending deepening of the Delaware River channel Trenton, N. J. The new report will recommend that Federal Government pay only part of the cost, with affected states and possibly industry paying the re Cost estimates have been refigured at $96 million.

INDUSTRY MOVES IN AS MAIN ISOTOPE USER — P.

Slow to employ radioisotopes at first, industry is n the main user. Estimate places number of industri firms using radioisotopes at 740, and industry's dema now accounts for 42 pct of AEC's isotope sales. Us include radiographic testing and thickness gagin Potential has hardly been touched.

TREND TO STEEL CONTAINER USE GROWING — P.

Despite a largely seasonal sales slump this fall, u of steel containers is growing. A dip in oil exports h hurt heavy barrel sales somewhat, but smaller co tainers are moving well. Inquiries from prospecti customers are high. Steel easing has helped, and r search is developing new uses, broader line.

IKE NAMES RAW MATERIALS POLICY GROUP — P.

A new national raw materials policy is in the makin And it's due in the White House early next year. Th President's first step was naming a four-man ta force at Cabinet level. The aim is a sound, workabl policy—one that will protect U. S. miners while assur ing adequate flow of raw materials.

BUDGET FOR '56 MAY TEST IKE'S INFLUENCE — P.

Although balancing the fiscal 1955 budget has ju about been given up, several influential congressme feel the next budget can—and will—be trimmed to in come levels. But Administration leaders will oppos severe cuts in foreign aid or military spending. Th President may have to prove his influence.

the Week in Metalworking

ENGINEERING & PRODUCTION

FABRICATORS EXTRUDE FOR FAST SERVICE — P. 165
Aluminum door and window makers benefit by installing extrusion presses. A variety of shapes can be produced to meet the growing need for quick service, lower material costs, better quality control. One fabricator using a 1250-ton press can make six extrusions at once. Extrusion dies can be switched in 5 min.

NEW BURNERS AID GALVANIZING QUALITY — P. 168
Life of galvanizing pots can be lengthened and operating costs cut with an improved radiant burner. This novel burner design permits complete combustion of the air-gas mixture within the burner cup. The result is more uniform heating. No flame impinges on the galvanizing pot. Temperature is held within 5°.

COLD "ROCKING" ANSWERS DESIGN PROBLEMS—P. 172
The growing number of shapes and tube forms produced by the Rockrite process indicates a wider field for application of the process to design and production problems. A wide variety of gear and cam shapes, tapers, inside upsets, outside stepdowns are being made. The process has improved mechanical properties.

WATER HEATERS BRAZED FOR STRONG JOINTS—P. 176
Copper for corrosion resistance and steel for strength are combined to produce hot water heaters at moderate cost, excellent serviceability. Joints are brazed or silver-soldered, depending on the metal combination. Flux is supplied in liquid volatile form through the acetylene line for complete protection during brazing.

BETTER TANKS INCREASE LIFE OF LININGS — P. 178
Investment in organic and synthetic linings for tanks holding corrosive solutions may form the largest part of tank costs. Top quality workmanship is a must in making tanks and applying linings. Aim of tank design and construction should be a close, permanent bond between lining and shell. Surfaces must be smooth.

NEXT WEEK—CAMSHAFTS ARE SELECTIVELY HARDENED
Camshafts for Chrysler engines are selectively flame hardened at the rate of 100 per hour under closely controlled conditions. Five Flamatics, automatically cycled, produce hardness penetration to ⅛ in. in 37 sec for a six-cylinder shaft and 48 sec for an eight-cylinder shaft. The setup features versatility.

MARKETS & PRICES

THIRD QUARTER STEEL PROFITS DOUBLE 1952 — P. 107
Production, sales and shipments of steel for the first 9 months of 1953 stood at alltime peaks. And third quarter profits were more than twice as high as in the third quarter of 1952. This gain is significant despite effects of last year's steel strike. For 9 months of '53 profits were up 86 pct.

AUTO DEALERS SOB FOR BIGGER PROFITS — P. 124
Almost without exception, auto dealers across the nation are charging that overproduction at the factory has saturated the market for new cars. Profits are cut to the bone by discounts they've been forced to grant, they say. Some price cuts are due in '54, but they may only widen dealers' profit margins.

CIVILIAN TOOL ORDERS CUSHION DEFENSE DIP—P. 135
Present indications are that 1953 machine tool output in the U. S. will approximate that of last year. Shipments are expected to be slightly ahead of 1952. But a month ago machine tool order backlogs stood at only 7 months, compared to 23-month peak of the Korean war. New civilian orders are taking some slack.

INDUSTRIAL PRICES ARE SHOWING STABILITY—P. 137
Prices of raw materials have been undergoing mild deflation, and industry's wholesale prices, though they have risen slightly during the last year, are remarkably stable. Industry should focus attention on price trends of manufactured commodities which have gone up little, despite increased production costs.

STEEL BUYERS KEEPING PRODUCERS OPTIMISTIC—P. 213
Steel users are making their buying intentions known, and their suppliers are pleased with the way new business is shaping up. Still in good demand are hot-rolled bars, light plates, structurals, sheets, and oil country goods. Merchant wire products are picking up, and tinplate spurt in December may set pace in 1954.

CHILE COPPER REPORT GOES UNCONFIRMED — P. 216
So far unconfirmed in Washington, latest report on Chilean copper negotiations is that an offer has been made. Tonnage is said to involve 150,000 tons. Price reported is 28¢ per lb for the first 100,000 tons, the rest at market price at time of shipment. Dow Co. reports that its magnesium mill is rolling.

Photos courtesy Kirk & Blum, Cincinnati, Ohio

72 HOLES

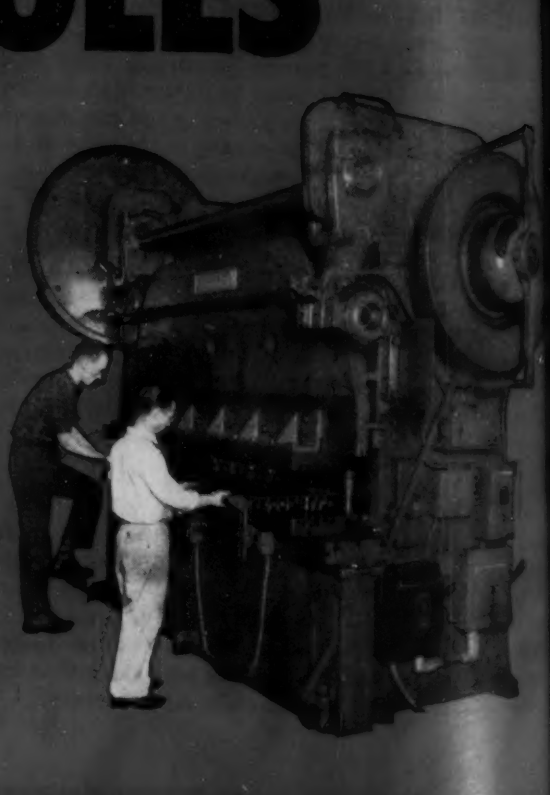
where they belong

Economical assembly depended on maintaining the accurate spacing of these 72 holes and their accurate positioning on this 10-gauge sheet.

This Cincinnati Press Brake is giving a high production at low cost by its speed and accuracy of performance, which insures rapid low cost assembly.

As a press, they offer high production with low investment. As a Press Brake, their low set-up costs, quick change-overs and versatility bring profits.

Write for Catalog B-4 where many examples of the versatility of Cincinnati Press Brakes are illustrated.



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National Business Publications

We're All In This Together

"WITHOUT better products and lower costs we cannot progress," say the production experts. "Production is inadequate without good salesmen," say sales managers. "We are stymied by distribution blind spots," say our marketing experts.

Labor says, "Put more money in the workers' hands and we'll have limitless prosperity." Paul Mazur, banker and economist, argues that only purchases are active—purchasing power is static unless used. In his book, *By The Standards We Raise,* he preaches an ever higher standard of living as our salvation.

The average American rules the roost. He doesn't personally use machine tools, eat steel, fill his home with capital machines, stock aluminum or buy earth movers. But he buys and uses every manner of product, machine or appliance which requires capital goods and basic raw materials.

Not too much is known about why people buy or why they stop buying. With all our vaunted research, books and studies we are still quite unable to adequately answer these questions. We have passed over the social and psychological reasons for spending.

There are some things we do know about the consumer. Scare or disgust him with depression talk, poor managerial judgment or ordinary products and he will start to postpone some purchases even though he is able to buy. Fail to improve your product, bypass research, stop advertising, and forget how to try to induce people to buy—that will make a recession a cinch.

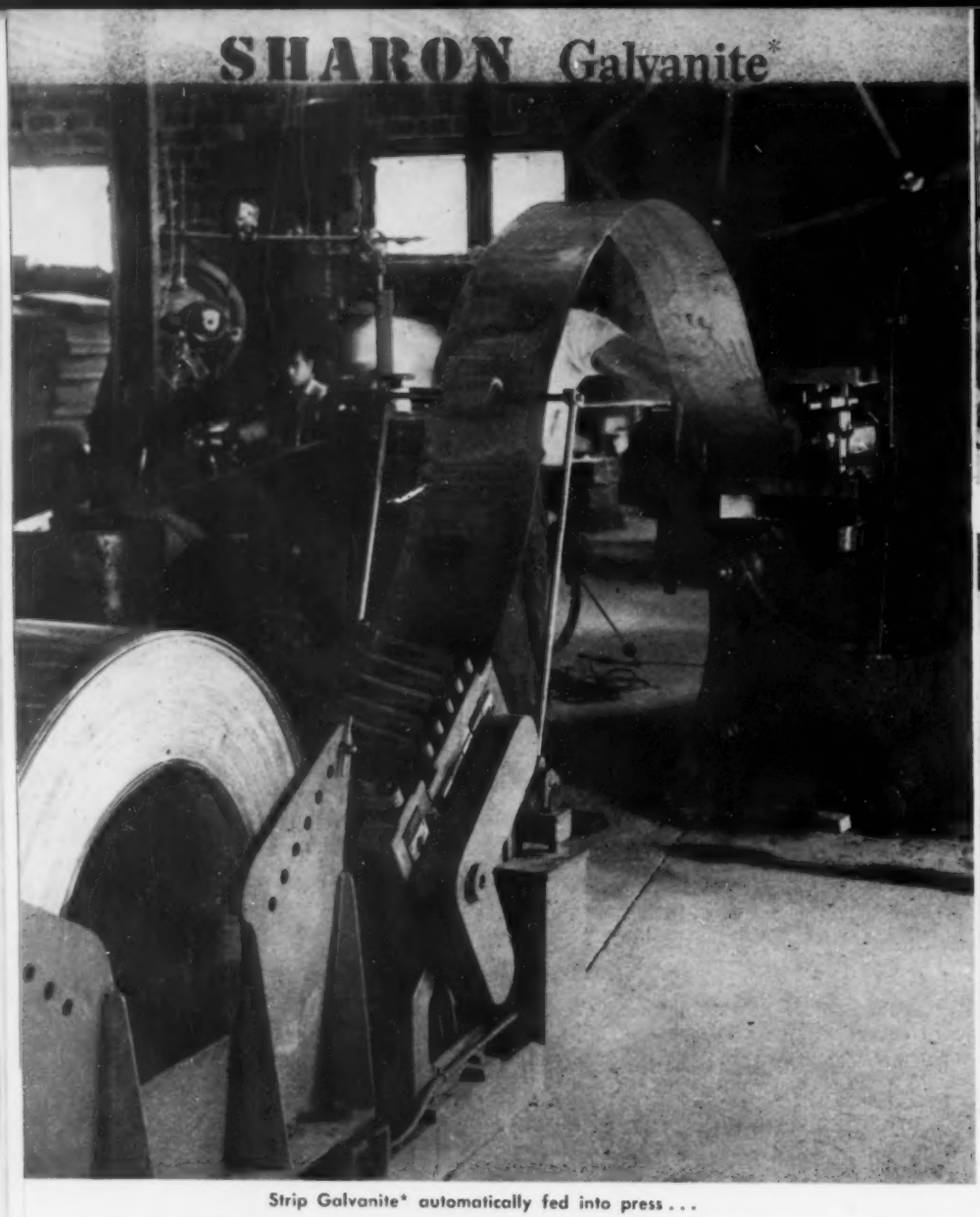
We need production experts as we never needed them before. We ought to have more salesmen who can *sell.* We can use more research on distribution. We must have an ever increasing standard of living. We should spend millions learning about people's buying habits.

We are heading into a period where bad judgment will be costly. We have more than 160 million people to think about. Ours is no longer a simple economy. If we falter we take the free world with us. There is a halfway mark between pessimism and optimism but more than that we need self reliance and confidence in our ability.

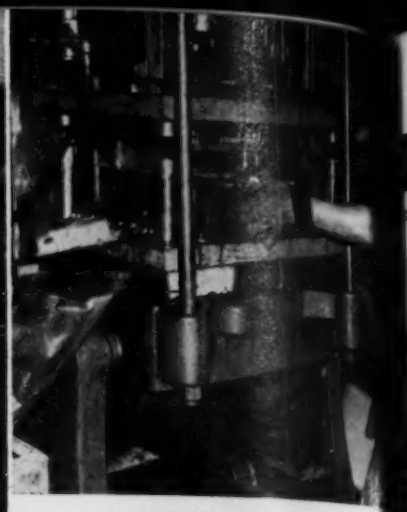
Think wisely, speak softly and act with good judgment lest you contribute to a man-made recession that could spiral into a serious depression. We are all in this together.

Tom Campbell

Editor



Strip Galvanite* automatically fed into press . . .



where multi-station die quickly forms

a special T-V bracket.

T-V Parts Manufacturer Improves Quality Speeds Production with Galvanite* Strip

Brackets and set bases for radio and television sets obviously must remain free of rust year after year. That's why almost every leading manufacturer of sets specifies a coated material of some description be used in the manufacture of these vital parts.

Recently parts manufacturers, after comparative tests, have switched to Galvanite*, Sharon's highly effective, rust-discouraging special process, zinc coated steel.

Further, Galvanite* in strip form† enables these manufacturers to produce directly from the coil, eliminating extra handling costs. The seven-station die, being used by this manufacturer, is typical of this trend in production methods, into which strip Galvanite* fits so perfectly.

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†Available in large coils and cut-to-length.

Send for your copy of Sharon's New Galvanite* Handbook.

SHARONSTEEL

*Trade name copyrighted by the Sharon Steel Corporation

Wherever Rust is a Problem . . . Specify Galvanite*

SHARON STEEL CORPORATION *Sharon, Pennsylvania*

Dear Editor:

Letters from readers

Lost: Steel Identification

Sir:

We cannot identify a steel which has the following symbol stamped into it: OSCO SPECIAL 10. The OSCO is surrounded by a semi-circle, closed on the bottom.

We have purchased your Tool Steel Directory but it does not list this steel. Any information you might be able to send in regard to its chemical analysis, manufacturer, heat treat data, etc. would be greatly appreciated.

D. L. PROBERT
Foreman, Tool & Die Unit
Hill Air Force Base, Utah

Perhaps one of our readers can help you with this problem.—Ed.

Fire Prevention

Sir:

I can't help but call your attention to the fact that your "Fire" article (Oct. 1, 1953) overlooks entirely the one type of extinguisher that has probably put out more fires than all other types combined. This is the vaporizing liquid type extinguisher which is available in various sizes, both the pump and stored pressure type.

TRUMAN YOUNG
Advertising Manager
Pyrene Mfg. Co.
Newark, N. J.

Our apologies. A check of our editorial staff indicates over 50 pct ownership of your type extinguisher. The man who finally approved the article has two.—Ed.

Liquid Honing

Sir:

In the Aug. 27 issue of THE IRON AGE, we noted with great interest the article "Gun Barrels Deburred and Cleaned by Liquid Honing" by W. G. Patton.

Would you please send us a tear sheet of this article if such is still available?

H. J. PROSSER
Sales Engineering Branch
Bonded Products & Grain Div.
The Carborundum Co.
Niagara Falls, N. Y.

Reading Racks

Sir:

May we have your permission to reprint from your Aug. 6 issue the article entitled "Reading Racks: Tell Your Story"?

A credit line will, of course, be given to THE IRON AGE and to Mr. E. C. Kellogg, the author.

GEORGE BRENN
Editor
The Foreman's Digest
Englewood, N. J.

Personnel Analysis

Sir:

In the Oct. 15 issue of THE IRON AGE appears the article "Analysis Method Helps Management Solve Personnel Problems" by W. B. Olson.

Because of its interest, we would appreciate your permission to have this reprinted for distribution to our members only. Proper credit would, of course, be given.

J. R. DERRICKSON
Executive Secretary
Formed Steel Tube Institute
Cleveland

Sheet Sorter

Sir:

In your Oct. 8 issue, reference is made on p. 275 to a new machine known as the sheet sorter.

We are very much interested in this particular machine and would appreciate further information as to the manufacturer or selling agent for this item.

J. A. DOLAN
President
Dolan Steel Co., Inc.
Bridgeport, Conn.

The manufacturer of this machine is the Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn.—Ed.

Better Plating Process

Sir:

I would appreciate two tear sheets on the article "Plating: Develop Better Process" by R. L. Hatschek which appeared on p. 44 of your Oct. 1 issue.

C. H. E. BECK
Standards Engineer
Gilfillan Bros., Inc.
Los Angeles

Organic Fillers

Sir:

Please send to my attention four tear sheets of the article "Organic Fillers Seal Defects in Metal Products" on p. 118 of the Oct. 15 issue.

R. H. WENDT
Exec. Vice President
Kiekhaefer Aeromarine Motors, Inc.
Fond du Lac, Wis.

Titanium's Stability

Sir:

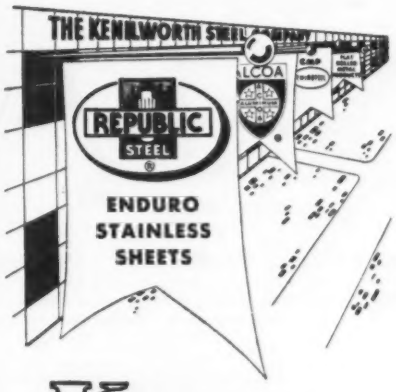
Please send me a few tear sheets of the article "Stability of Titanium in Vital Operating Range" from your Oct. 22 issue.

I. C. CLINGAN
Director of Laboratories
Eastern Stainless Steep Corp.
Baltimore, Md.

IT'S A GOOD BET YOU'LL FIND A

Full House OF JUST THE STAINLESS SHEETS YOU NEED AT KENILWORTH STEEL and THE KIND OF SERVICE YOU WANT, TOO

There's no gamble on quality, of course, when Republic Enduro Stainless sheets are available. And it's nice to know you can have along with them all of the good service identified with Kenilworth at not one extra penny of cost. We know you'll enjoy doing business with Kenilworth. Customers tell us we've set a new standard in warehouse service. They say it's a "good deal." Your inquiry or order for Stainless sheets or any of the "in stock" flat rolled metal products here at Kenilworth that require specialized service or processing for your need will be the best proof—so, test us today.



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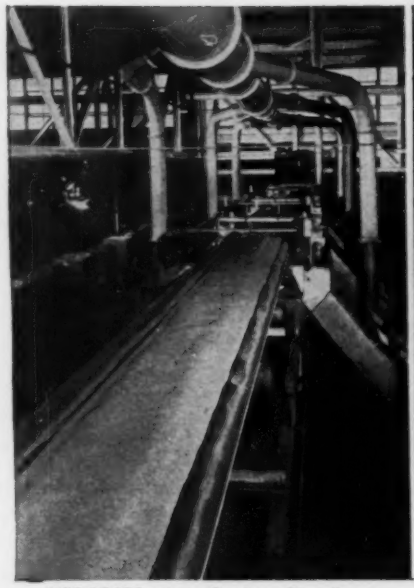
NEW FORD FOUNDRY EQUIPPED WITH 7 MILES OF GOODYEAR BELTING

ONE of the largest and most modern foundry plants in existence, the new Ford Cleveland Foundry, is equipped with Goodyear Conveyor and Elevator Belting—7 miles of it. Many of the belts were spliced by vulcanization on the spot.

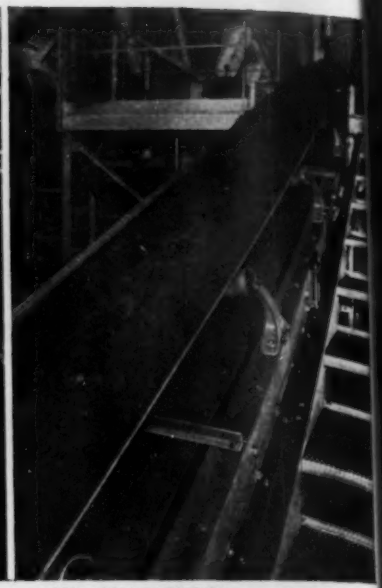
Belting for each installation was specified by the G.T.M.—Goodyear Technical Man—after he was called in by The Cleveland Foundry group, which did all design, layout and engineering for the new Ford plant.

In any foundry operation, it will pay to consult the G.T.M. *first* about belting requirements, for he knows rubber in all its forms better by far—your assurance of long, trouble-free service. You can reach him through your nearest Goodyear Distributor, or by writing:

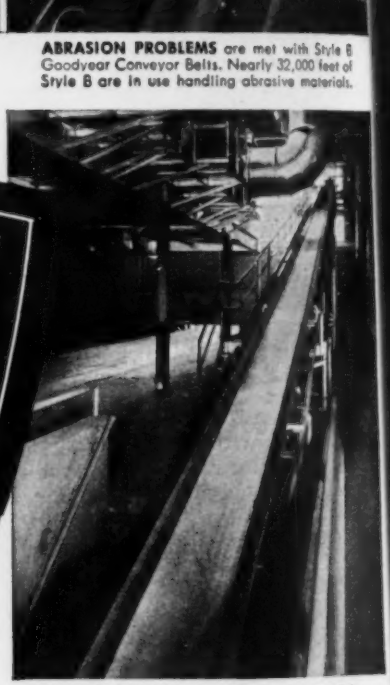
Goodyear, Mechanical Goods Division, Akron 16, Ohio.



HOT LOADS ride on Goodyear Glass Carcass Conveyor Belting designed to handle materials in the very-high-temperature range.



ABRASION PROBLEMS are met with Style B Goodyear Conveyor Belts. Nearly 32,000 feet of Style B are in use handling abrasive materials.



OILY MATERIALS are easily handled by Goodyear-designed CHEMIGUM Belting—which resists swelling far better than ordinary rubber covers. CHEMIGUM also resists oil far better than many other "oil-resisting" synthetics.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing, Tank Lining, Rubber-Covered Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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Fatigue Cracks

by William M. Coffey

Hold The Presses

When 90,000 people, among them the management officials and engineers of America's greatest industrial companies converge on a big city to swap new ideas in manufacturing techniques, new products, methods and processes it's a big story for THE IRON AGE. It's the Cleveland National Metal Show story.

And when you realize there were 425 exhibitors and some 230 technical papers presented, the reporting of such a grandiose event takes on the aspects of a real operation. The show closed on Friday, Oct. 23. A 4-page report on it appeared in your ffj the following Thursday, Oct. 29.

The editors tell us that normally it's no trick to fill four pages in that space of time. The real trick was to find and report the *high spots* and boil them down to four pages. And find them fast and report them fast.

Planning for show coverage started weeks ahead—editorial assignments, layout, even the poses for the "Mr. Smith Goes to Cleveland" series. By opening day of the show five technical editors were at work in Cleveland. Assisting technical editor Gene Beaudet were assistant technical editor Walter Patton, finishing editor John Obrzut, metallurgical editor Bill Latiano and machinery editor Ed. Egan, Jr.

On Thursday our New York slot man, associate editor Bill Olson was on hand at editorial headquarters in the Cleveland Hotel to whip the copy into shape and take it back to New York that night. By this time he had spot reports from ten other district and news editors who had each spent a day at the show.

Not everything worthwhile was put into that issue, space and time being what they were. The biggest payoff is yet to come—lots and lots of good leads for future technical articles on what's new in metalworking of interest *to you*.

Why Not?

Stumbled on to a new way to brighten up the day. Reached the office the other day for an early 8:15 quickie appointment. About 8:45, remembered we had skipped coffee, so grabbed the hat and started for the elevator to go down and do the necessary. Ran into the managing editor coming up. Simply said "Good night," automatically. (You never say "Good morning" *leaving* the office.)

A few minutes later it occurred to us "does he think we worked all night?" And that started a train of thought. Why not for the fun of it reverse everything you do. If it's true as they say that "change is the spice of life" then here's a way to live it up a little. For instance, why not have apple pie with ice cream for breakfast some morning, or work **Saturday** and Sunday instead of Monday and Tuesday, or smoke cigarettes from the other end, or kiss your wife or ride a horse to work. Or something.

Letters

You know we send out letters to people telling them about the fine qualities of THE IRON AGE to get them to subscribe. One of the letters refers to the fact that only the "cream of the crop" takes IA, of course. One fellow wrote back that he was just the skim, but could he subscribe anyway? Weeellllll. Guess so.

Puzzlers

How many horses, cows and pigs did Farmer Jones have? One horse, three cows and five pigs, of course. Winners: Donald Hanan, Laurie Kaplan, Walter Speyer, Lou Wolff, C. R. Weihe, Irma Gibbs, H. R. Boyer, John Underwood, G. G. Brun, Fay L. Whitcup and J. J. Brugman.

And just for the record here's a late roundup of winners to previous puzzlers: James A. Leahy, E. A. Chimner, Carl R. Knadler, P. L. Lester and Roger Pailson were right with 15% on the discount puzzler. J. A. Stansell, Russell J. Cress, B. L. Hutchinson and Paul Hirsch came up with 60 mph for the car puzzler. Bernard W. Davis, Jr., E. G. MacGrath, Charles W. Moreno, Sally Falk, John Hines and Stanley Dombroff at 7 and 5 measures of corn for the mule puzzler, 7 for the Mule and 5 for the Donkey. Late winners, too, for the apple falling problem (answer: fifth day after counting at 2 PM) are: C. H. Frederick, Harry A. Day, R. W. McBride and James Myrick.

New Puzzle

If a fish has a head 4 inches long and a body as long as his head and tail put together and a tail as long as his head and one-half his body, how long is the fish?

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by the Originators of Grade A Greaseproof Barriers

Relative to Military Specification

JAN-B-121, Amendments 1 and 2

There has been considerable misinformation and confusion as to what products qualify under Amendments 1 and 2 of Military Specification JAN-B-121.

The Specification has been amended several times for the purpose of assuring that the armed forces obtain only the highest quality materials that have proven their worth in actual field performance.

The requirements of the Amendments are clean-cut. To meet them, a greaseproof barrier must resist both natural and synthetic slushing agents for extended periods. It must be neutral and practically acid-free. It must stand up under aging tests without change.

All grades of INDUWRAP, the original Grade A, meet and exceed without qualification all of these requirements and we so certify on all shipments.

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More than twelve years' successful usage by industry and the military has established *creped* INDUWRAP as the most satisfactory greaseproof wrap on the market. Angier's process of creping after combining kraft and acetate film, produces a material of maximum flexibility and resilience. It is easy to handle—saves time and labor. It conforms to odd-shaped objects. It gives greater cushioning protection.

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Over the years, Angier's research group has spent thousands of man hours studying all commercially available films offered as greaseproof barriers. Time and time again, cellulose acetate has proved its superiority—in the laboratory and by actual field performance—for use with natural and synthetic slushing agents. There are other films in use and some of them have a very definite place in industrial packaging. But none of those now available has lived up to the "cure all" claims that have periodically been made for them. INDUWRAP'S structure of cellulose acetate, laminated to Red Kraft by an exclusive neutral adhesive, makes it the finest greaseproof wrap available today for use on slushed metal parts.

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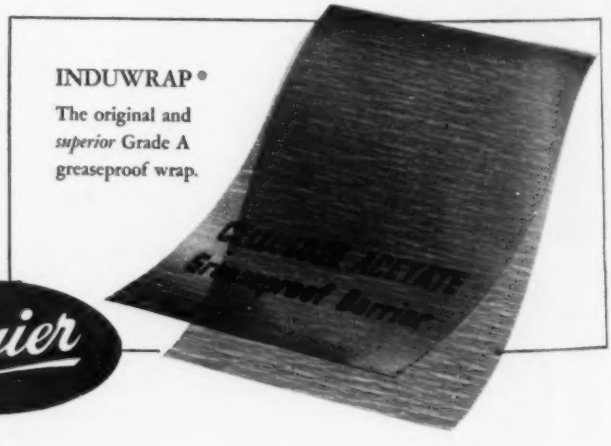

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The Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

BETTER LABOR-MANAGEMENT RELATIONS will be the aim of grass roots discussions planned by Ben Fairless and Dave McDonald. The long postponed local level meetings were planned by Mr. Fairless and the late Phil Murray as a means of settling local problems before they become big issues.

A NEW METHOD OF INDEXING technical information for quick recovery is being tested by Armed Services Technical Information Agency. The new Uniterm Coordinate Indexing system will save catalog space, cut cataloging time, get you information faster.

BIGGEST FACTOR IN SHORT TOOL LIFE may be poor handling on the part of personnel. Rough, careless treatment in the shop or in the toolroom can be offset by better planning, more training. Centralized tool grinding may also help.

REVERSING THRUST OF JET ENGINES for braking effect in landing jet transports is latest gimmick being tried by Boeing engineers. Similar in effect to present reversible pitch propellers, backward thrust would permit landing on shorter runways.

NEW HIGH-SPEED FACSIMILE system uses cathode ray tubes for sending and receiving. Military is interested in this industry researched development. Image of electrostatically charged "dust" is transferred to paper on contact, baked under infra-red lamps. Transmission rate is ten 9 x 12 in. pages per min.

SMALL BUSINESS FIRMS, now getting 56 cents of Army procurement dollar, may expect a larger percentage during the current fiscal year. Recent revision of Army procurement policy places small business specialists with each technical service, procuring agency.

PILOT PLANT TO TEST commercial feasibility of a new process for making a comparatively cheap, low-purity titanium is expected to be completed soon. Method has been tried in the lab. Inventors claim a plant could be built in a few months to turn out 10 to 20 tons a day at less than $1.25 to $1.50 per pound.

A CATALYTIC MUFFLER to remove fumes from internal combustion engines burning leaded gasoline, will soon be ready for market. Some cities are reported already considering requiring them for use on autos as an air pollution control measure.

NATIONAL PROBLEM is the term insurance companies are applying to industrial noise. Growing industry awareness of problem is indicated by prominence given to subject at industrial hygiene conferences. It ranks high in overall human relations picture.

PRESSURE ON THE ROOFING BUSINESS to develop a fireproof or fire retardant adhesive for factory roof construction is coming from industry in general and the auto industry in particular. Even if vaporseals are removed, an adhesive is still necessary for most roof construction. A wide market waits the successful manufacturer.

CAST-TO-SHAPE METAL PATTERNS are finding increased application in production of pump parts, rubber molds, lens molds and similar applications. The cast metal patterns, produced by a special process, require practically no machining. Only polishing is necessary.

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STEEL: Third Quarter Profits Double 1952

Industry profits are 100.8 pct over third quarter 1952 . . . Still significant despite last year's strike . . . For 9 months '53 profits were 86 pct ahead—By W. V. Packard.

The steel industry's profits were more than twice as high for the third quarter of 1953 than they were in the similar period of 1952. Production, sales, shipments of steel for the first 9 months of 1953 stood at alltime peaks.

The brighter profit picture is revealed by a compilation of steel company financial reports just completed by THE IRON AGE. Included in the compilation are 20 companies accounting for about 90 pct of the industry's ingot capacity.

Earnings Up 100.8 Pct

The 20 companies together earned $178,028,631 in third quarter of 1953, compared to $88,642,151 in third quarter of 1952, an increase of $89,385,480, or 100.8 pct.

Of course, third quarter earnings last year were adversely affected by the 54-day industry-wide strike, about half of which was applicable to third quarter operations.

But the third quarter profit rise is still a significant achievement. A look at the record shows that, despite last year's strike, third quarter 1952 profits were only 24 pct less than for the third quarter of the 1951 boom.

Rose 86 Pct In 9 Months

Tabulation of the steel company financial reports by THE IRON AGE also indicated industry earnings for the first 9 months of this year were about 86 pct higher than they were during first 9 months of 1952. Although the first 9 months of 1952 reflected the entire impact of the steel strike, earnings then were only 38 pct below the similar portion of the 1951 boom.

Steel company earnings potentials will be greatly enhanced if excess profits tax is allowed to expire the first of the year. For example, in the case of Bethlehem Steel, of $144 million provided for federal taxes during the first 9 months of this year, $26.7 million is for excess profits tax.

Increased third quarter 1953 earnings were fairly general throughout the industry. Following are some of the steel firms whose earnings fluctuated more violently than the bulk of the industry because of their expansion activity. All are third quarter 1953 and 1952 comparisons.

Republic Steel's third quarter earnings this year nearly tripled—$14,048,033 compared to $5,158,092. Jones & Laughlin, $8,807,000 compared to $810,000. Youngstown Sheet & Tube, $8,057,691 compared to $2,546,846. Wheeling Steel, $2,939,795 compared to $843,523. Colorado Fuel & Iron, $2,483,797 compared to $577,900. Pittsburgh Steel, $99,188 compared to $1,872,000.

Sharp profit increase of most of these firms shows that expansion programs which had been interfering with operations started to pay off.

Steel Optimists Speak Up

Reduced third quarter earnings of Pittsburgh Steel resulted when the firm had to cut back its operations to permit completion of additional steps in its expansion program. Pittsburgh's earnings for the first 9 months were actually 79 pct higher than a year ago.

At press conferences held to an-

Steel Company Earnings

Company	Third Quarter '53	Third Quarter '52	Nine Months '53	Nine Months '52
U. S. Steel	$61,706,264	$30,405,472	$166,723,028	$96,158,606
Bethlehem Steel	34,030,204	17,116,975	93,525,340	41,421,705
Republic Steel	14,048,033	5,158,092	42,758,557	21,420,148
Jones & Laughlin Steel	8,807,000	810,000	25,170,000	5,411,000
National Steel	13,003,384	7,234,419	37,078,116	22,781,009
Youngstown Sheet & Tube	8,057,691	2,546,846	23,001,897	11,051,464
Armco Steel	10,042,784	7,740,292	26,121,317	22,305,678
Inland Steel	8,371,796	4,794,694	24,049,317	16,139,754
Colorado Fuel & Iron	2,483,797	577,900	.....	.....
Wheeling Steel	2,939,795	843,523	9,995,443	4,059,042
Sharon Steel	1,681,034	1,398,246	5,782,001	2,338,768
Kaiser Steel	2,621,378	1,666,492	.....	.....
Crucible Steel	1,637,566	1,260,575	.....	.....
Pittsburgh Steel	99,188	1,872,000	4,549,900	2,537,600
Barium Steel	559,994	858,976	2,762,069	2,176,701
Allegheny Ludlum Steel	2,038,776	997,120*	6,300,421	3,346,000
Granite City Steel	2,285,929	1,194,333	5,474,198	2,339,527
Detroit Steel	1,195,221	967,786	4,695,085	3,010,975
Alan Wood Steel	900,567	537,051	2,454,885	1,323,130
Copperweld Steel	2,443,353	1,464,553†	.....	.....
Rotary Electric Steel	548,559	.....	2,066,741	1,277,190
Keystone Steel	.....	1,180,913	.....	.....
Continental Steel	270,098	164,592	1,157,785	924,604
Eastern Stainless Steel	.....	.....	816,727	544,195

* After giving effect to $962,000 tax credit
† Includes $256,551 tax credit

nounce earnings, industry leaders left no doubt of their swing to market optimism.

Benjamin Fairless, U. S. Steel chairman, reiterated his belief that steelmaking operations would stay close to capacity for the rest of this year. After explaining that he is an optimist, he added, "I certainly would think that our operations would be at least at 95 pct of capacity in the first quarter of '54."

He continued that U. S. Steel's order backlog is 7.7 million tons, down only 300,000 tons from second quarter. New orders are at a good pace, though off from the feverish pace of several months ago. Ore supplies are in good shape with no need for winter rail movement. U. S. Steel is nearing completion of its two biggest building projects, Venezuelan ore facilities and Fairless Works. All Fairless Works furnaces are operating, but production is being geared up slowly, is now at 75 pct of capacity. U. S. Steel income so far this year is 5.7 pct of sales, compared to 4.5 pct for the same period last year. Mr. Fairless and United Steelworkers of America leader David J. McDonald will very soon begin their long-contemplated series of local meetings to improve labor-management relations.

Why Business Is Good

Eugene Grace, Bethlehem Steel chairman, reported his company is currently operating at 104 pct of rated capacity, compared to the industry average of about 95 pct. "We see no reason why our operations should change to any extent for the balance of the year."

A survey of Bethlehem district sales offices just completed finds them generally optimistic. Auto industry is going to have another good year. And railroads are going to buy more than in 1953.

Bethlehem's order backlog is $730 million, down $109 million from the previous quarter. But only about $29 million of the decline is in current, real orders, the balance being attributed to abandoned CMP set-asides, and shipbuilding.

Bethlehem is currently building 26 merchant ships and three naval vessels, but its program will end in 1954 without new orders.

IRON & STEEL: September Output By Districts

As Reported to the American Iron and Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Annual Capacity	PIG IRON Sept.	PIG IRON Year to Date	FERROMANG., SPIEGEL & SILVERY IRON Sept.	FERROMANG., SPIEGEL & SILVERY IRON Year to Date	TOTAL Sept.	TOTAL Year to Date	Pct of Capacity Sept.	Pct of Capacity Year to Date
Eastern	16,312,990	1,132,582	10,970,631	24,613	252,270	1,157,205	11,222,901	86.4	92.0
Pitts.-Youngstn.	28,643,120	2,205,058	20,586,596	35,152	311,751	2,240,210	20,898,347	95.3	97.5
Cleve.-Detroit	8,633,800	690,046	6,369,502	.....	.....	690,046	6,369,502	97.4	98.6
Chicago	16,251,250	1,322,221	11,808,416	2,058	11,457	1,324,279	11,819,873	99.3	97.2
Southern	8,020,380	461,416	4,193,981	7,868	72,804	469,284	4,266,785	95.0	94.8
Western	3,518,700	320,995	2,926,201	.....	.....	320,995	2,926,201	111.1	111.2
TOTAL	79,380,240	6,132,330	56,855,327	69,689	648,282	6,202,019	57,503,609	95.2	96.8

STEEL —NET TONS DISTRICTS	Annual Capacity	TOTAL STEEL* Sept.	TOTAL STEEL* Year to Date	TOTAL STEEL* Pct of Capacity Sept.	TOTAL STEEL* Pct of Capacity Year to Date	ALLOY STEEL Sept.	ALLOY STEEL Year to Date	HOT TOPPED CARBON INGOTS Sept.	HOT TOPPED CARBON INGOTS Year to Date
Eastern	23,863,810	1,663,532	17,007,621	84.9	95.3	123,131	1,424,923	328,801	3,388,508
Pitts.-Yngstn.	43,621,000	3,285,765	31,831,455	91.8	97.6	446,065	4,807,302	431,184	4,065,324
Cleve.-Detroit	12,002,900	909,916	8,542,227	92.4	95.1	67,175	729,676	69,899	772,218
Chicago	24,960,600	2,007,128	18,604,254	98.0	99.6	129,023	1,334,958	305,793	2,887,059
Southern	8,036,160	484,817	4,342,443	97.8	86.2	4,033	43,910	6,494	48,334
Western	7,063,000	532,270	5,182,617	91.8	98.1	5,879	103,930	28,971	244,011
TOTAL	117,547,470	8,883,428	85,510,617	92.1	97.3	775,306	8,444,699	1,171,142	11,405,454

* Includes Alloy Steel, Hot Topped Carbon Ingots.

Wages:

White House door seen open for new wage floor boost.

The White House has skillfully avoided committing itself on boosting the statutory minimum wage standards. No such recommendation has been made to him, President Eisenhower says. But he admits that he has talked over "extension" of present laws. This is generally interpreted as leaving the door open for White House approval.

Report persists that before former Labor Secretary Martin Durkin resigned in high dudgeon, a plan cooked up by the department for increasing the statutory minimum from 75¢ an hour to $1 was sent to the Budget Bureau along with other legislative recommendations.

Thumbs down by the White House wouldn't mean the kiss of death for the proposal, however. In some quarters, this contingency is seen as merely giving steam to the drive for raising the minimum. Several bills are already pending in Congress, some proposing minimums of as much as $1.25 an hour. It is regarded as certain that pressure will be brought to get these bills pried out of committee and onto the floor of Congress.

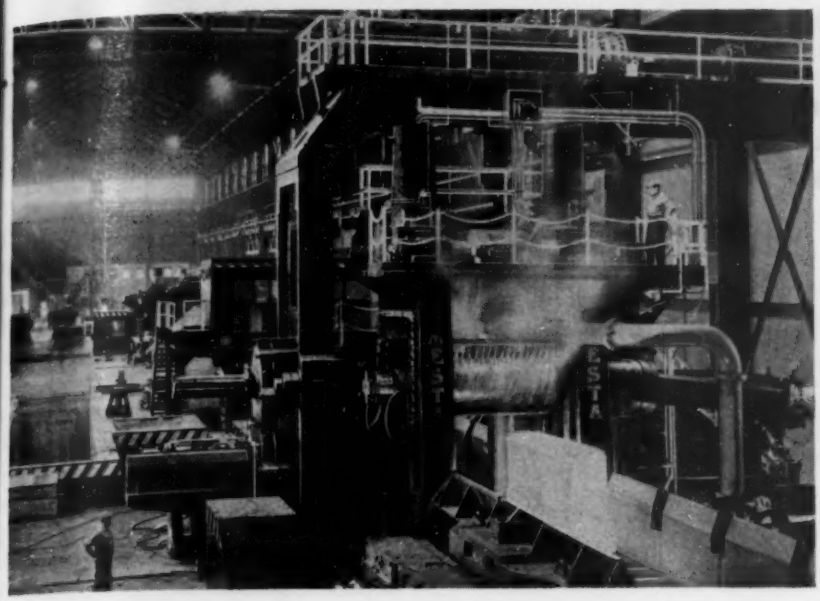
Puerto Rico Wages Up

One wage action that did come out of Washington last week was the lifting of standards in Puerto Rico.

A new minimum wage of 68¢ an hour for workers in primary metals, heavy fabricated metal products, and mining has been ordered for Puerto Rican industries by the U. S. Labor Dept.

Effective Nov. 30, the federal action was taken under authority of the Fair Labor Standards Act and followed public hearings.

Ordered into effect at the same time were increased minimums of 58¢ an hour for employees in light machine shops and small industrial equipment factories and the full 75¢ an hour for drydock operations.



STEEL: Great Lakes Beats Schedule

Ingot capacity to hit 4 million tons 30 days ahead of timetable . . . New slabber already at work . . . Will finish 3 million tons of steel annually—without conversion.

Great Lakes Steel Corp. will reach 4 million tons of annual ingot capacity on Dec. 1—hitting that expansion mark a full month ahead of schedule. These 4 million tons of ingots will be worked down into 2 million tons of cold-rolled and 1 million tons of hot-rolled products a year with the rest remelted as scrap.

But they won't go through the firm's finishing mills until the 45 x 90 in. slab mill pictured above has done its job. Originally slated for production on Jan. 1, it began trial and break-in runs on Oct. 23 and is now in full operation—2 months ahead of schedule.

The Ecorse, Mich., mill, the only integrated operation in Detroit, now supplies 35 pct of cold-rolled automotive tonnage.

The 16,000-hp mill can handle ingots weighing up to 20 tons and turn out slabs tipping the scales at 7½ to 8 tons. This permits the production of cold-rolled coils 61½ to 73 in. wide, weighing 7 to 8 tons without a single weld to hamper a customer's production.

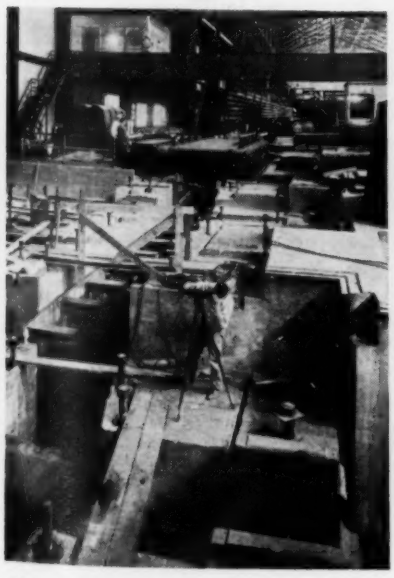
Production in 1946 totaled 600,000 tons of hot-rolled steel. During the past 4 years, output has averaged 1.5 million tons of cold-rolled and 800,000 tons of hot-rolled products. But this required the use of conversion steel.

Won't Need Conversion

An important result of the two new bessemer converters coming in will be the elimination of higher-priced conversion business.

Total facilities at Great Lakes' main plant at Ecorse, Mich., are: 17 openhearths, two bessemers operating and two more nearing completion, 21 soaking pits, one 40-in. and one 46-in. blooming mill, the 45 x 90-in. slabbing mill, a 21-in. bar mill, a 34-in. and a 96-in. strip mill, a 10-in. and a 14-in. merchant mill, and one 54-in. and two 96-in. cold mills.

The blast furnace division at Zug Island includes four blast furnaces, 146 coke ovens operating and 70 more under construction, ore docks, storage facilities.



FOUNDATIONS going in for slabbing mill.

SHEAR cuts slabs to size, trims ends.

POWER comes from motor room.

DELAWARE: Channel Deepening Delayed

Army Engineers revise report on river dredging . . . Now recommend states, maybe industry share costs . . . Up figure to $96 million . . . Delay hurts area's industrial potential.

When first iron ore starts moving from Cerro Bolivar to U. S. Steel's Fairless Works in about 2 months, it will not be the way the Corporation planned it. There will be no deep water channel to permit ocean carriers to service the $400 million-plus plant on the Delaware.

Ore arriving in big boats will have to be moved into the plant by rail, or by smaller boats or barges. Similar transshipment will be required for outgoing ocean shipments.

Result is that advantages of tidewater location envisioned for the huge East Coast plant will remain largely potential until the Delaware River channel is deepened.

Army Revises Report

It's a good bet that the channel will ultimately be deepened. Work could start next year. But the project still faces rough sailing. And much of the optimism following favorable recommendations by U. S. Army area engineers last February has been wiped out.

It has been learned by THE IRON AGE that the Corps of Engineers has revised the report of the district engineers (THE IRON AGE, Feb. 19, 1953, p. 59.) That report called for the Federal Government to furnish all the funds. A new report on the channel has been written. It specifies that part of the funds would be furnished by the affected states, and part possibly by industry users of the Delaware River channel.

May Start Early

Estimated cost of the project, originally placed at $87 million, has since been revised to $91 million, and finally to $96 million.

Of the $96 million cost estimated in the latest report, $18 million would be provided by affected states (Pennsylvania, New Jersey, and Delaware) with perhaps some help from industry. The report is now being studied by the three states and the various affected industries.

Corps of Engineers is preparing to submit to Congress early next year its recommendations for digging and financing the channel. Similarly, the new budget, which goes to Congress in January, will include a request for federal funds to do the digging.

Industry Arguments Strong

This is the fiscal '55 budget, so the funds voted by Congress wouldn't be available until next June. But it might be possible to switch some funds around to start the project earlier—provided it gets the expected green light.

If state legislatures are called upon to furnish part of the funds, the project might be further delayed. Some opposition might be expected to develop from farmers and urban communities who have argued in the past that fertility of fields and potability of village water would be imperiled by salt water seeping from a deeper channel.

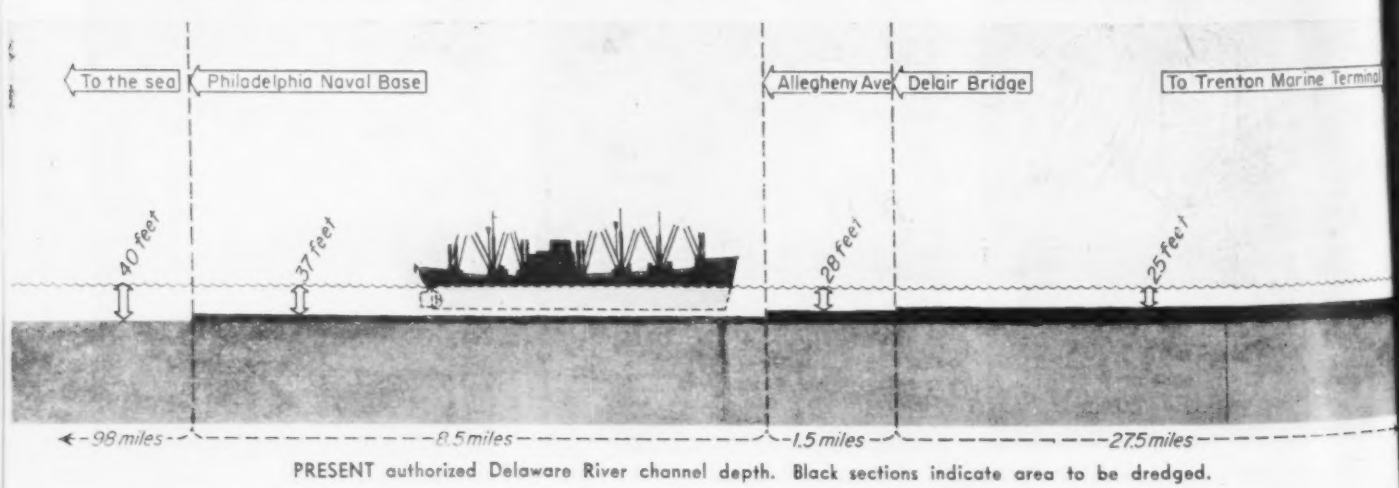
In the long run, however, industrial expansion arguments are expected to prevail. Fairless Works is only one of 8000 industrial plants along the 135-mile Delaware "Gold Coast" from Trenton to the sea. So U. S. Steel has plenty of industrial neighbors who stand to profit by a deep water channel.

Now Under Limits

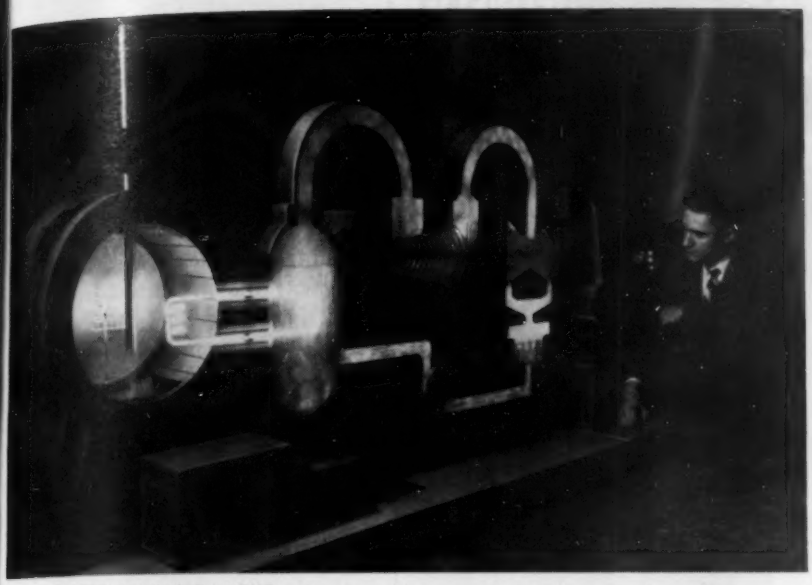
Delaware Valley industry is in the midst of its greatest boom (THE IRON AGE, Dec. 18, 1952, p. 75.) Altogether some 300 firms are building or expanding in the river valley. Area expansion cost is estimated at $4 billion or more, with over $2 billion of it being spent directly on new or expanded plants and facilities.

The accompanying chart shows presently authorized channel depths. The black area indicates recommended channel deepening.

Actually in many places midchannel depths are today less than now authorized by Congress. For some 25 miles below the city of Trenton, the channel depth in several places has shoaled to as little as 17 ft.



PRESENT authorized Delaware River channel depth. Black sections indicate area to be dredged.



WESTINGHOUSE MODEL of an atomic-powered electric generating plant.

ISOTOPES: Industry Is Now Main User

Slow to employ radioisotopes, industry is now using 42 pct of total sold by AEC . . . Potential hardly touched . . . How they cut costs . . . Typical applications—*By E. C. Kellogg.*

"Only 1000 radioisotope shipments of 27,000 from Oak Ridge have gone to industry. The great balance have found eager takers in medicine and agriculture."

This comment on industry's suspicious reception to use of radioisotopes appeared in the Oct. 23, 1952, issue of THE IRON AGE. The statement was based on discussions at the National Industrial Conference Board's first conference on atomic energy in industry.

Industry Major User

But this attitude has changed radically. Last week, Paul Aebersold, director, Isotopes Div., U. S. Atomic Energy Commission, told the same NICB group at its second annual atomic energy meeting in New York that, "Industry is now the largest user of isotopes."

More than 740 industrial firms now employ isotopes for such applications as radiographic testing and thickness gaging. And industrial demand has heightened so rapidly that it now accounts for 42 pct of AEC's isotope sales.

Some of the reasons singled out by the AEC director for this surge of industrial interest are: (1) Improved sources of supply; some commercial firms now provide packaged isotopes. (2) Better, more versatile equipment is now available from instrumentation companies. (3) Industry is learning more about how to use isotopes.

Surface Only Scratched

Potential for expanded industrial use of radioisotopes was pointed out by John Kuranz, vice-president, Nuclear Instrument & Chemical Co. At the request of the American Society for Testing Materials, he recently studied a random sample of 350 standard ASTM test procedures to determine how many could be conducted better or faster with radioisotopes.

Cursory examination of the 350 test methods showed that 5 pct could be performed more efficiently with radioisotopes. Mr. Kuranz added that a detailed study would undoubtedly have raised this percentage.

Wide open highway for future development of radiation gaging was hinted at by E. D. Cook, General Engineering Laboratory, General Electric Co., who told executives attending the NICB conference, "Industrial products which cannot utilize contact gaging means are the field for radiation gages."

Contact gaging cannot be used efficiently in industrial operations where materials move at extremely high speeds. The "chatter" caused by the high speed movement of the material makes the contact gage indicator fluctuate so much it is difficult to get a reading.

How Isotopes Cut Costs

In discussing the cost-cutting advantages of continuous radioactive gaging, R. F. Errington, manager, Commercial Products Div., Atomic Energy of Canada Ltd., said the closer control made possible by this method enables manufacturers to narrow tolerance limits for their products. This frequently results in considerable savings in material used.

He cited the case of rubber sheet which was being produced at a mean weight of 200 grams per sq meter with a ±5 pct tolerance. Use of radiation gaging made it possible to narrow tolerance limits to ±3 pct and reduced mean weight to 196 grams per sq meter. This resulted in a 2 pct cut in material used.

Mr. Errington also described Carborundum Co.'s novel use of isotopes in the pneumatic tube mail carrier system at its Niagara Falls plant. Mail carriers are tagged with 2 microcuries of Cobalt 60 so that if there is a breakdown in the line and one of the carriers gets stuck, it is a simple matter to locate the trouble spot with a geiger counter.

Locate the Leak

W. R. Weir, chief metallurgist, Dominion Foundries & Steel Ltd., said his company is employing isotopes extensively in its steelmaking operations. Typical is its use of radiation gaging in connection with annealing.

Previously Dominion found that

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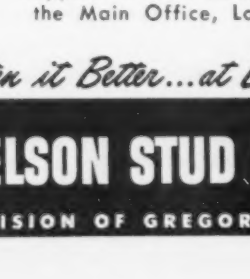

... right in your own plant how your production and your products can be improved with this modern fastening method. Your design and production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

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NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

if there was a change in the gage of the steel being processed, annealing was sometimes incomplete. By using continuous radiation gaging the annealing furnace operator is now able to adjust the speed of annealing operations whenever the gage changes.

Homer S. Myers, president, Radioactive Products Inc., mentioned the way his firm used isotopes to aid a homeowner who was harassed by an unlocatable leak in his hot water system. Because of the leak, fuel bills were running about $300 a month. Radioactive Products was called in and decided to put a small amount of radioactive iodine in the hot water line. After this had been done it was fairly easy to locate the leak with the aid of a geiger counter.

To Study Atomic Power for Ships

Government thinking continues along the lines of using atomic energy as power for surface ships, although a Navy project for a nuclear engine for an aircraft carrier was shelved earlier this year for economy reasons.

Atomic Energy Commission last week approved a proposal by the Newport News Shipbuilding & Dry Dock Co. to go ahead with a 1-year study in atomic power, at no cost to the government.

Hint that the program might be continued for more than 1 year is contained in the AEC statement that disposition of discoveries and developments made during the study will be decided later by the commission.

". . . and the motor fits into either the front or back, depending on where you want to store the luggage."

CONTAINERS: Packaging in Metal Grows

Producers report many new business inquiries . . . Sales dip seasonal . . . Oil export cut hurt barrels . . . Small containers move well . . . Steel easing helps—By K. W. Bennett.

Watch for a climb in metal packaging. One metal container producer reports 25 queries weekly from industry, seeking means for putting their products into metal containers. And, each week, at least 3 of the 25 become strong possibilities for future business.

Though currently steel container business has dropped in volume, the industry is moving small containers well, with heavy barrels off. Sales chiefs feel that the drop in export oil, first felt early last year, and again much more strongly in January of this year, hit the heavy barrel trade more than any single factor. They do not expect to see the oil market revive.

Sales Estimates Vary

On the other hand, steel containers are of increasing interest to the chemical, food, and stockfeed industries. Barrels are expected to move with increasing volume in these lines. Adding impetus to these rising markets will be the adoption of new lining materials. These should expand considerably the range of chemically active materials that can be shipped in steel containers.

Overall estimates for this year's business vary widely. Several firms will do more dollar volume in 1953 than in any previous year, though even here unit sales are off somewhat. Other firms report drops ranging from 5 pct to 15 pct. In a few instances, the figure may be higher. But the drops are not a cause for alarm. Here's why:

Steel Easing Recent

Only within the last few months, generally, have a good number of container producers been able to give their sales forces a free hand. Until then, sheet supplies had been so binding as to actually limit sales.

In a few cases, where the drop-off in oil container sales eased steel supply situation somewhat, supply was not a great problem, but cold and hot-rolled sheet generally have been a restricting problem, particularly in the Midwest. In some cases the raw material picture has only been simplified in the last 6 weeks.

Push Product Research

Fourth quarter slump in container sales represents a return to a normal seasonal selling pattern. Barrel salesmen report that the fourth quarter, historically, represents a period of slow movement for their firms. Normally, the cycle begins to pick up slightly in first quarter, and hits full pace in second and third.

And selling forces are in full strength at present. Most firms began strengthening their sales forces as early as 2 years ago, are now ready to push hard for available business.

Coupled with this is an intensive series of research programs. New developments under field test or on the market include lithographing steel containers, printing on them, reworking liner materials for transporting chemicals, and a lighter gage steel barrel to force down costs.

"You're blind! He missed the plate by .002 of an inch."

One advance currently under test will coat sheet steel with a chemically inert plastic. The coated sheet will then, at a relatively low manufacturing cost, be rolled into a barrel that can handle hard-to-move chemicals, foodstuffs, or what have you. Frozen foods are already being put up in 55 gallon drums. Orange juice is one example.

In a few cases, metal parts are being canned or packed in steel barrels for shipment. One instance is a type of locknut, another is railroad track spikes. Both cases are proving out on the market, despite the higher cost of lithographed containers in which one of the products is being packed.

Pack Metal in Metal

Packing of metal products in metal containers has been a sleeper. Despite considerable research by Air Force and Ordnance during the war, civilian users didn't move quickly when peace came.

It appears that this year the first serious civilian-consumption movement in this direction is beginning.

Currently, Air Force small jet parts are being packed in what were formerly tomato cans, jet engines are sealed in special steel barrels, and some electrical equipment immersed in oil is being shipped in steel containers. Reports from industry indicate that the trend to civilian packing of metal parts will continue but is not expected to become a heavy volume item. Development of lighter containers, however, will encourage it.

But consumers and potential consumers of metal containers are asking increasingly about (1) containers that will handle new materials, and (2) small containers that will serve as an advertising medium for the product inside.

Fire:

Ford bans vapor seal in new plant roofs after tests.

Wholesale revisions in industrial plant construction to minimize fire danger are firmly on the books for the near future. As a result of test fires staged by Ford Motor Co. last week, the vapor seal, a conventional feature of roof construction is definitely on the way out, at least as far as Ford is concerned.

Literally even before the smoke cleared away from the General Motors Detroit Transmission fire last August, fire experts said that a major cause of the fast spreading of the fire was the dripping of molten flaming tar or pitch from the roof. As a result of last week's tests, Ford eliminated the vapor seal from all plants now under construction or planned for the future.

Use Two Buildings

Ford previously had its own fire disaster when the Livonia tank plant burned before it reached completion.

In explanation, a vapor seal is a conventional feature of roof construction. It consists of plies of felt mopped with asphalt pitch or tar to the top of the roof deck. It lies between the metal roof deck and the insulation layer. A regular roof consists, from bottom to top, of the roof deck, vapor seal, insulation, tarred layers of felt topped by a coating of pitch embedded with particles of slag.

In the Ford tests, two buildings were constructed, each representing a section of a typical factory building. One contained a vapor seal and the other did not. When jets of fuel oil were ignited to simulate an industrial fire, the vapor seal in the first building caught fire in less than 10 minutes, dripping flaming tar to the floor where, in factory conditions, it would spread fire to other locations.

Test Checks Theory

Thermocouples in the building indicated that a temperature of 1500 F was reached, but the temperature on the top of the roof remained normal.

Ford plant specialists were convinced by the demonstration that their theory about the danger of vapor seals was correct. Actually, Ford engineers had reached this conclusion before the GM fire, but staged the demonstration to provide controlled proof.

Under the same conditions, roof decking in the building without vapor seal buckled and insulation smoldered, but no tar dripped through to ignite material within the building and temperature on top of the roof also remained unchanged.

WELDS MELT and steel siding collapses.

In both cases paint burned and welds in the steel sides and roof deck melted. The fire was not kept going long enough to melt any of the steel girders.

Paint Shows Worth

A secondary point of the test indicated the value of fire-retardant paint. Temperatures from thermocouples embedded under fire-retardant paint were more than 100° less than those registered from similar positions protected by only orthodox paint.

Meanwhile, it has been reported that GM is attempting to develop a model industrial building code. This is an attempt to do away with some of the confusion resulting from a lack of uniformity in building codes. Each division has been able to follow its own course, subject to the specific rules and regulations of each community, without uniformity.

SMOKE, FLAME billow from test structure equipped with a vapor seal.

$6 Million Plant for Acme

Acme Steel Co. of Chicago, Ill., manufacturers of steel box strapping, strip steel, cooperage hoops, strapping tools, wire stitchers, stitching wire and other specialties, has acquired a site in Birmingham, Ala., for construction of a $6 million plant.

Construction is expected to start soon after the first of the year, but the company has not announced what items will be made.

MATERIALS: Ike Names Policy Group

Aim is sound, workable policy to cure mining ills, assure raw materials supply . . . Must fit with tariff and foreign trade policies . . . Wheels turning—*By A. K. Rannells.*

A new national raw materials policy is in the making. It's due to be sent to the White House early next year.

President Eisenhower's first step was naming a four-man task force at Cabinet level. They're to get at the facts, make recommendations to the full Cabinet. White House aim is a sound, workable policy—one that will protect the domestic mining industry while guaranteeing a flow of raw materials adequate to meet any new crisis.

Have Lacked Unity

Numerous attempts to cure mining ills have been made in the past. There has been a President's Materials Policy Commission. Congressional committees have investigated and held hearings—they still are.

But the big trouble in the past has been the tendency to concentrate on single segments rather than the mining industry as a whole.

An example of this piecemeal approach is the current hearing on stockpiling. Simultaneously the U. S. Tariff Commission is investigating problems of the lead-zinc industry. The Tariff Commission report is due in Congress by Mar. 31.

Lead to Control

Indications are that the Administration is dissatisfied with this hodge-podge approach as well as pending legislative proposals. These vary from subsidies to import quotas and specially rigged tariffs. Also getting frequent mention is the possibility of adjusting tax structure as a means of adding incentive.

Too many of these invite government control in one form or another.

In setting up this intra-Cabinet group, the President hinted strongly that its recommendations are wanted well ahead of the due date for the Tariff Commission report to Congress. This is given as evidence that the Administration is getting ready to carry the ball itself.

Trade Talks to Start

An official close to the White House admits this timing is significant in another respect. It's no secret that the Administration wants to increase the flow of U. S.-foreign trade—and is strongly supported by several industrialists.

Clarence B. Randall heads a 17-man industry-government committee to look into foreign trade. Preliminary talks are slated to begin abroad next week. (See p. 131.)

Because of the market sensitivity to imports of domestically mined products like lead and zinc, the President wants his Cabinet report early enough to consider in connection with that of the Randall commission, this official hints.

Interior Secretary McKay is chairman of the intra-Cabinet task force. Other members are Commerce Secretary Weeks, State Secretary Dulles and Defense Mobilizer Flemming.

Wheels are already turning, with Assistant Secretary of the Interior Felix Wormser responsible for gathering the needed information. He has been instructed to draw upon the Budget Bureau, the Treasury Dept. and other departments and agencies for whatever help he needs. This includes data already compiled by the Materials Policy Commission.

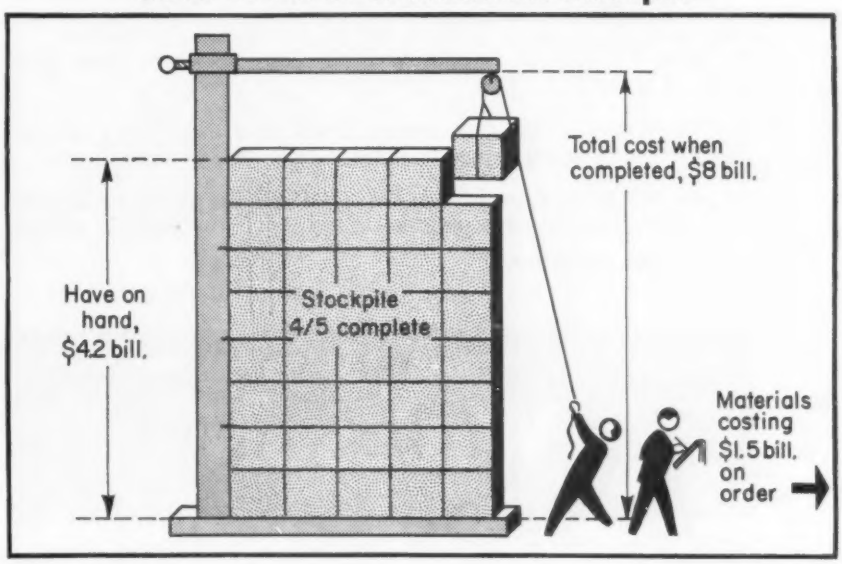
To Build Rail Cars for Korea

Railway car builders are due for a small shot in the arm from orders amounting to $12 million which will be placed in connection with the relief and rehabilitation of Korea.

Under authorizations made last week by the Foreign Operations Administration, $9,770,000 will go for standard freight cars, $420,000 for narrow-gage freight cars, and $1,810,000 will be spent for passenger coaches.

It is reported in Washington that European and Japanese railway car builders are to be permitted to participate in the $12 million Korean order.

State of the U. S. Materials Stockpile



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STYLE CC-70

◀ For Chippers

Willson *Super-Tough*® lenses are heat-treated for impact resistance. (*Note* four screened eye cup ports admit air to keep lenses fog-free)

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3. Standard 50 mm. round lenses make it unnecessary to stock odd-size replacement lenses

4. Extra ventilation is provided by slots in screw caps plus ports in cups

5. *Rigid metal top bar* makes Kover-Mor Goggles easier to handle; keeps them firmly in place

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—Manufacturing—

ECONOMY: Drift

Purchasing agents report lower rate of industrial activity . . . Optimism still rules.

Despite some indications that our economy is continuing to edge downward as it has for the past few months, the nation's purchasing agents are not predicting dire recession. They regard these trends as more of a tapering-off than an outright slide.

In analyzing general business conditions, National Assn. of Purchasing Agents states that the 3-month trend to lower industrial activity continued through October. Order books are getting lighter and production cutbacks are reported.

Prices Are Holding

Prices are tending to level out, showing more weakness than strength, and sales efforts are being stepped up sharply. Inventories of purchased materials are lower, and employment dropped for the second straight month. Purchasing agents say buying policy is generally on a 60-day-or-less basis.

Overall, however, purchasing agents say there are few real distress signs apparent around the country. Rather than being pessimistic about the fourth quarter, their attitude is one of cautious optimism.

Payrolls Dip

Prices of industrial materials during October showed a tendency to stay where they were, as 74 pct of the PA's contacted said there was no change. Competition in fabricated parts is much sharper and larger quantity discounts are reported. Escalation is fast disappearing, and freight absorption, elimination of premiums in steel negotiations are becoming more common. Price has become more important than delivery to many buyers.

NAPA reports inventories are still being cut, with the accent on turnover rather than additional protective inventory. Warehouse supplies are ample, service rapid, supporting the growing buyer tendency

Still Downward

to place smaller orders frequently. Lower payrolls are indicated by one-third of the purchasing agents, the largest number to report such conditions since January, 1952. Production cutbacks are given as the main reason, though some areas attribute the payroll drop to strikes and seasonal changes.

Canada Trends Down

Industrial activity in Canada, which was reported to have been better than in the U. S. in recent months, is trending to a similar pattern. Back orders and production have held up better, but the overall direction is downward. Prices are about in line, while inventories are up and employment is off.

Metals Pay $85 for 40-Hour Week

Workers in the primary metals industries are the third best paid group of all manufacturing industries, according to the latest round-up on pay compiled by the Labor Dept.

Pay in the steel, aluminum, and other basic metals fields averages $85.03 for a 40-hour week, the U. S. Labor Dept. says, as compared with an average of $70.49 for a 39½-hour week for all factory employment.

Overall pay has increased 3¢ an hour for metals industries since last January as compared with a 4¢ increase for all manufacturing industries.

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NEOX (reinforced neoprene) coated gloves fit widest range of work

Never before a glove so equally resistant to abrasion, cutting, oil, acids, solvents, caustics, degreasants and heat. Good flexibility and grip. All Edmont coatings are bonded to strong fabric linings for comfort and snag-resistance. Full coated or palm coated.

"Redmont" NEOX gloves for heaviest duty service and safe grip

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Safety engineers approve white-fabric lined, rubber-coated Grab-its

Tough, flexible, rough-textured natural rubber, bonded to sturdy white fabric lining, gives positive non-slip grip, wet or dry. Outwear ordinary canvas gloves up to 10 times. Far safer, too.

Grapplers grip even in grease; outwear other plastics 50%

Coated with DUROX, a leather-like reinforced plastic that retains its grip when wet, is extremely resistant to abrasion, oil and coolants, and stays flexible. Perfect fitting, too. Note wing thumb and curved, pre-flexed fingers.

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Edmont job-fitted gloves

INVESTORS: Have $15 Billion Abroad

Private investments by U. S. in foreign enterprises are growing at $1 billion per year clip . . . Canada gets nearly half . . . South America seeking more—By *A. K. Rannells.*

Non-government investments by the U. S. in foreign industrial and commercial enterprises are growing at the surprisingly fast rate of more than $1 billion per year. And most economists, both in the U. S. and abroad, favor this trend because they believe private investment of American money does more to hypo faltering foreign industries and build up new ones than can be accomplished with handout aid.

A check shows that in 1950, latest date for which complete data are available, Americans had a $12 billion stake in more than 7500 commercial enterprises outside U. S. borders.

For the most part, this capital has been put up by about 2300 companies and corporations—mainly in oil fields, ore mining, power development, automotive branch factories. However, an undetermined number of individual investors managed to pick up more than $1 billion worth of holdings.

Trend Up Since '50

Investment abroad has shown an upward surge during the past 3 years. Indications are that investment of American money outside the U. S. will have passed $15 billion by end of this year.

Only about half the present investment rate represents new money, however. Earnings on American capital abroad amount to about $1.1 billion annually. About $600 million is returned to the investors in form of dividends and the remaining $500 million is held for reinvestment.

For various reasons, Europe as a whole has failed to take advantage of the growing urge of Americans to acquire foreign holdings. Red tape and tight restrictions too often discourage opportunity seekers.

So it is not surprising that the lion's share of U. S. foreign investment capital has been put to work in the Americas rather than in Europe.

Canada, which attracts the largest share of U. S. foreign investments of any single country, has been pulling in nearly half our total outlay since 1950. During this period U. S. holdings in Canada have risen from $3.6 billion to $5 billion.

One obvious reason for this trend is the nearness of Canada, which makes it easier for smaller firms to branch out into foreign operations.

Another factor is that Canada is a major source of important raw materials ranging from pulpwood to nickel, from iron ore to platinum metals.

Where Money Goes

Primary and fabricated metals, automobile, and pulp and paper manufacture lure roughly about 40 pct of total investment money. Various mining enterprises continue to attract investment. And more recently there has been a strong swing toward development of oil fields in the western provinces and iron ore in the east.

South American countries, which altogether attract $6 billion in U. S. investments, have been making direct overtures in the form of special concessions to gain an even larger share of Yankee capital. As an example, Colombia is presently exempting from taxes capital invested in Colombian aircraft.

Likewise, Venezuela now permits aliens to invest or engage in almost all forms of business (exception: no new oil concessions have been approved since 1945) on the same basis as nationals. While they are subject to most normal taxes, outsiders are exempt from special defense and related levies.

Publicize Opportunities

In some instances, in cooperation with the nations involved, the U. S. Commerce Dept. has issued informational handbooks on specific Latin American countries. The publications give industrial background information as an incentive to investment.

Trend toward outside investment of private capital will be given added impetus when the realigned Bureau of Foreign Commerce gets rolling smoothly. One branch is given the specific job of watching for investment opportunities abroad and seeing that they are publicized.

West Europe Steel Output Dips

Latest reports to THE IRON AGE indicate West European steel output is still declining. Production for the first and second quarters of 1953 was 18,286,000 net tons and 17,384,000 tons, respectively. Estimates now place third quarter steel output at about 16,645,000 tons and predict fourth quarter will total some 16,000,000 tons or less.

Fabricated Structural Steel
Contracts, Shipments, Backlog

	Estimated Net Tons		
	1953	1952	Avg. 1947-50
CONTRACTS CLOSED			
September	217,600	207,695	215,870
Year to Date	2,238,194	1,938,925	1,744,468
SHIPMENTS			
September	255,599	227,595	197,331
Year to Date	2,297,482	1,952,702	1,689,123
BACKLOG	2,040,534	2,342,374	1,321,835

Source: American Institute of Steel Construction

Steel Pool:

Aged equipment, integration lack get low output blame.

While the six members of the European steel pool employ approximately the same number of workers (about 600,000) as the U. S. steel industry, they produce only about 40 million tons of steel annually against 100 million tons in this country.

Lack of modern equipment and lack of sufficient integration of individual firms are given as the two major reasons.

Obsolescence is being aggressively attacked and gradual improvement is expected in the first condition. But the second is a basic weakness and is being heavily attacked by German steelmen.

Germany's five major steelmakers, which produced 88 pct of that nation's steel before the war, were split into 31 separate companies. This de-integration pushed up costs, didn't help output.

Firms to Combine

Now, anticipating the ratification of the peace treaty which will permit German steel's reunification, producers have been given the green light to build up integrated companies again.

One of the first will be the Thyssen Corp., the most modern European steelmaker.

THE IRON AGE is told that mergers can be predicted in all European countries except Italy. In France three major producers, Acieries de Longwy, Senelle-Maubeuge Corp., and Escaut et Meuse, have decided to unite. The new firm will be known as S. A. Lorraine-Escaut, will own capacity to produce 1.6 million tons of steel, 1.3 million tons of pig iron and 740,000 tons of coke annually.

Other mergers are reportedly coming up in Belgium and the Saar. Cockerill plants will form the nucleus in the Belgian merger and Roechling-Buderus AG will be major participant in the Saar build-up.

English Woo Home Auto Market

Johnny Bull is coming into his own as an auto buyer again. He's only been able to window shop at every Auto Show in London since the war—but things are changing now.

While cars have been on show, they've been tagged "for export only" or, if they were available for home sale, they were subject to indefinite delivery. But now manufacturers have cars for sale and Mr. Bull had to be careful at the London Auto Show or he might have been sold half a dozen new cars.

Sales competition is rising as evidenced by price cutting, new styling and innumerable gadgets—all in the past 12 months. Mr. Bull is rubbing his eyes, wondering if the old jalopy won't hold out till prices come down some more.

Ford's new model, the "Popular," is claimed to be the cheapest in the world. Base price is $770, purchase tax brings the tab to $1095. And mileage is terrific.

Good sales are predicted for the "Popular" which is being built at Ford's Dagenham works at a 250-per-day clip. Introduction of this new low-priced model is reported to have already depressed prices in the British used car market. Good sales are predicted and the production rate can be stepped up considerably.

All other automakers are likewise looking for British customers. Earlier emphasis was on exports because steel supplies were doled out according to manufacturers' overseas sales records. Now steel is plentiful again and car makers can produce as many units as they like. So they're after domestic and foreign markets alike with no holds barred in their competition.

Few other surprises were noted at the show. Among them were plastic bodies by two manufacturers, which did not seem to arouse noticeable public interest. One of these, the Singer "SM," is a four-cylinder "export only" model pictured above.

One German manufacturer displayed a diesel-powered passenger car. Price tag is forbidding to the average Britisher—but with gas at 63¢ per Imperial gallon the diesel is of more than academic interest to Mr. Bull.

Steel:

New England mill gets tax aid . . . Site still unknown.

Rapid amortization on 65 pct of the estimated cost ($26,400,000) of erecting a 300,000-ton steel mill in New England was approved by the Office of Defense Mobilization last week.

The certificate, which authorizes fast write-off on $20,502,000 worth of the equipment planned for the projected mill, was issued by ODM to the New England Steel Development Corp.

Scrap for Furnaces

Two electric furnaces, both employing all-scrap charges, and one rolling mill are blueprinted for the projected steel works. Ebasco Services, Inc., acting as agent for undisclosed backers of the mill, estimates that sufficient scrap is generated by New England industry to keep the planned furnaces in operation.

Site for the projected mill had not been selected early this week. But existing ODM policies require the plant be located at a "properly dispersed" site. This means that the New England steel development Corp. must select a site at least ten miles from any probable target of enemy bombs.

(See THE IRON AGE, Oct. 29, p. 40.)

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Motor, self synchronus, 730 ea, $68,401, Ketay Mfg. Co., New York.

Buffer assy, 4135, $90,692, The Leavitt Machine Co., Orange, Mass.

Lock bolt, 4135, $80,829, The Leavitt Machine Co., Orange, Mass.

Actuator for FJ-2 aircraft, 260 ea, $54,499, Airesearch Mfg. Co., Div. of the Garrett Corp., Los Angeles.

Disconnect & tube assy, V, $74,720, R. E. Darling Co., Bethesda, Md.

Distributor and ignition harness assys, V, $132,888, Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y., *A. W. Dietrich.*

Maintenance parts, V, $143,044, Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y., *A. W. Dietrich.*

Hydraulic pumps, V, $246,564, Vickers, Inc., Detroit.

Fuel pump assy, V, $362,520, Thompson Products, Inc., Cleveland.

Pneumatic charger for aviation armament, 1375 ea, $54,271, Erno Machine Co., Inc., White Plains, N. Y.

Accumulator assy, V, $187,022, Sprague Eng. & Sales Corp., Gardena, Calif.

Maintenance parts, V, $138,492, Scintilla Magneto Div. Bendix Aviation Corp., Sidney, N. Y., *A. W. Dietrich.*

Hydraulic power pump assy, V, $92,261, The New York Air Brake Co., Watertown, N. Y.

Shield assy, 460 ea, $158,268, Curtiss-Wright Corp., Woodridge, N. J.

Lathes, vertical turret, 6, $279,943, The Bullard Co., Bridgeport, Conn.

Diesel locomotives, 6 ea, $1,021,703, Electro-Motive Div., General Motors Corp., LaGrange, Ill., *W. O. Nelson.*

Gilding metal rotating bands for 105 MM shells, 1400000 lb, (202604 bands), $8,258,992, Canadian Commercial Corp., Ottowa, Canada.

Shell, 60 MM mortar, 75000, $90,000, Parish Pressed Steel Co., Reading, Pa.

Tool & Die:

Government tells NTDMA its plans to continue buying.

Tool and die manufacturers have received assurance that the government will not stop buying machine tools and other equipment despite its current storage program.

Talking at a meeting of the National Tool & Die Manufacturers Assn. at Asbury Park, N. J., last week, Assistant Secretary of the Army for Material John Slezak said "Tools and dies will be bought for standby plants as well as for current production. I believe these procurement programs will help to prevent your vital industry from falling into dark days as has happened in the past."

Mr. Slezak said the nation's standby capacity is now divided into three categories: (1) Entire factories for production of complicated, long lead time items, (2) packages of machines and tools kept together in the same plant or warehouse and (3) equipment stored in central storage depots.

Bethlehem to Build Ammo Ships

Bethlehem Steel Co. will handle design work on the first U. S. Navy vessels planned from the keel up as ammunition ships.

Work on plans for the new class of ammunition ships (AE) will require more than 10,000 man-days, the Navy estimates. Construction of two vessels of this type is authorized in the 1954 shipbuilding appropriation, but building contracts have not yet been awarded.

Overall length of the new ships will be 502 ft. Displacement will be about 10,000 tons. They will have elevators for internal handling of ammunition.

The design problem is similar to that worked out recently by Bethlehem on the AO-143 class of Navy oilers. However, considerably more internal planning is required for the ammunition vessels.

Award Alaska Pipeline Contract

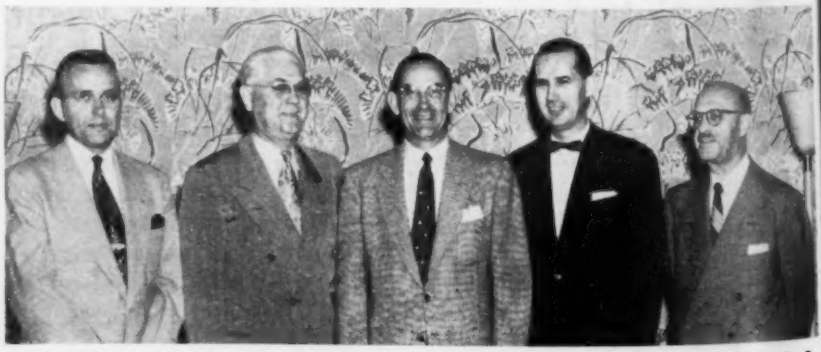
Army Engineer Corps has awarded a $29 million contract for construction of a 610-mile pipeline from Haines to Fairbanks, Alaska.

Construction will start shortly and is scheduled to be completed by September 1955. It will be for military use only, to assure supplies from the seaboard to interior military bases.

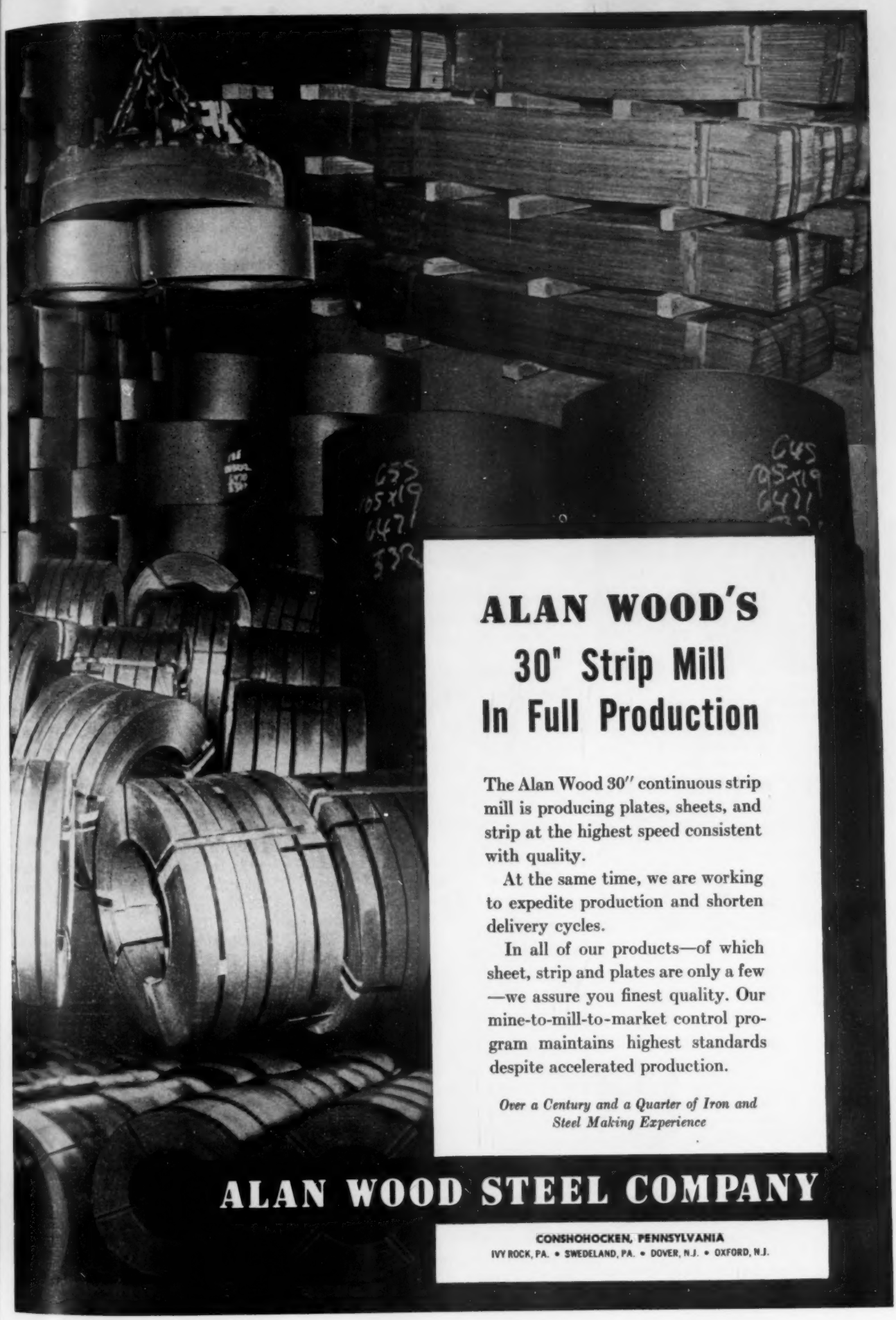
Locomotive Order Backlog Dips

Installation rate of new locomotives by the railroads is running over 30 pct less than last year and the order backlog at the factories has been reduced by one-half.

Class I roads installed 1667 units in three quarters '53—2417 for '52.



HEADING the National Tool & Die Mfrs. Assn. for the next year are: (l to r) P. R. Marsilius, treasurer; J. N. Huser, second vice-president; H. C. Murrer, president; J. H. Stanek, first vice-president, and A. Goldman, secretary.



ALAN WOOD'S 30" Strip Mill In Full Production

The Alan Wood 30" continuous strip mill is producing plates, sheets, and strip at the highest speed consistent with quality.

At the same time, we are working to expedite production and shorten delivery cycles.

In all of our products—of which sheet, strip and plates are only a few —we assure you finest quality. Our mine-to-mill-to-market control program maintains highest standards despite accelerated production.

Over a Century and a Quarter of Iron and Steel Making Experience

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PENNSYLVANIA

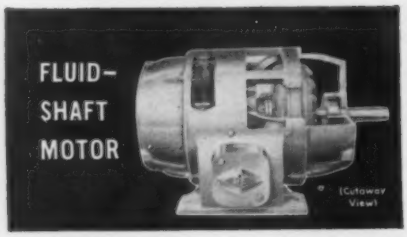
IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N.J. • OXFORD, N.J.

motor design problem?

...maybe one of these

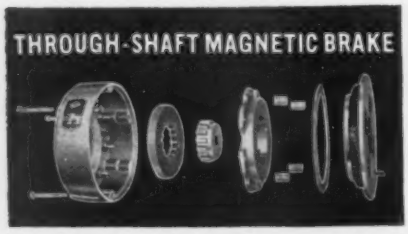
REULAND *"specials"*

will solve it!



Motor with *internal* fluid coupling. Provides smooth load acceleration. More compact than separate motor and coupling. *Assures perfect alignment.* Will start heavier loads than standard motors of same horsepower. Used on cranes, conveyors, mixers, etc.

Consists of Reuland motor and worm gear reducer. Provides unlimited mounting versatility. Permits use of 1 high speed and 2 slow speed power-take-off shafts, if desired. Ideal for designing into cramped quarters. Also available with Fluid-Shaft drive motor.



"Doughnut" type design allows extension of shaft entirely through brake. Permits use of TWO output shafts per motor. Can be mounted on the input or output shafts (or both) of Fluid-Shaft motors and motoreducers. Only 6 major parts . . . self adjusting . . . half usual length.

OVER 600 SPECIAL ELECTRIC MOTOR DESIGNS

There is a good chance the Reuland "library of specials" contains a unit already tailored to your needs. Its availability will save development work and put you in production faster. Write today, outlining your particular problem. No obligation, of course.

REULAND
ELECTRIC COMPANY

WESTERN DIV.—Alhambra, Calif. • EASTERN DIV.—Howell, Mich.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

Industrial Briefs

Good Work . . . REPUBLIC STEEL CORP.'s Southern Div. has been commended for an outstanding job of selling U. S. Savings Bonds through its payroll savings plan. In its mines division 1530 of 1531 employees are now buying bonds regularly, and in the steel district 4669 of 4784 employees have signed up.

New Line . . . Hydraulic Power Div., THE HYDRAULIC PRESS MFG. CO., Mt. Gilead, Ohio, has a complete new line of hydraulic cylinders, valves, pumps, motors, power units and accessories.

Contract Awarded . . . BALDWIN-LIMA-HAMILTON CORP., Philadelphia, has been awarded the contract to furnish propellers, and its Standard Steel Works Div., Burnham, Pa., was awarded the contract to furnish propeller shafts for three 60,000-ton ore carriers being built for National Bulk Carriers, Inc.

New Home . . . JAMES H. KNAPP CO. has moved to a new plant at 1731 Workman St., Los Angeles.

Newly Formed . . . TECH STEEL & ALLOY CORP., 843 N. California Ave., Chicago, is a newly formed company. It will supply hot rolled and cold finished alloy and carbon steel bars in a complete range of sizes to the trade.

Contract Division . . . BECKMAN INSTRUMENTS, INC., South Pasadena, Calif., has formed a new operating division to handle development, engineering and production work under selected government contracts.

Good Luck . . . AVONDALE MARINE WAYS, INC., has just begun publishing a new house organ called Avondale Salutes.

Majority Vote . . . THE NEW YORK AIR BRAKE CO. and Kinney Mfg. Co. stockholders will be asked to vote on a merger plan. Directors of the two companies approved the plan recently.

Under Construction . . . LURIA ENGINEERING CO. is constructing two newly-designed, standardized alert hangars for jet fighter interceptor aircraft, equipped with new-type doors that open in 30 seconds or less, for the U. S. Air Force.

Office Moved . . . ARTHUR D. LITTLE, INC., has moved its mid-western office from St. Louis to Chicago. It will be located at Board of Trade Bldg., Room 3832.

American Distributor . . . L. H. CHAPPEL & CO., Fairfield, Conn., has been appointed exclusive U. S. distributor for Summit metal cutting tools, Sheffield, England.

Purchases Plant . . . NATIONAL AUTOMOTIVE FIBRES, INC., Detroit, has purchased a plant in Cohoes, New York, from Beaunit Mills, Inc., and is increasing its facilities for manufacturing automotive trim products.

Honorary Degree . . . Harold F. Robinson, chief naval architect, BETHLEHEM STEEL CO.'s Quincy, Mass., yard, has received an honorary degree of doctor of engineering at the University of Michigan.

Regulation Lifted . . . National Alloy Div. of BLAW-KNOX CO., Pittsburgh, reports that lifting NPA order M-80 limiting the use of nickel on Nov. 1 will make their new heat resistant alloy NA22H generally available.

Keep 'Em Rolling . . . MONARCH MACHINE TOOL CO., Sidney, Ohio, has passed the $1 million mark in sales of roll turning lathes.

Plant Addition . . . DOLAN STEEL CO., INC., has constructed a $50,000 addition to its plant at Bridgeport, Conn.

Division Established . . . THE RELIABLE SPRING & WIRE FORMS CO., Cleveland, has established a Small Order Div. as a part of its current expansion program. John S. Pabijan has been appointed manager.

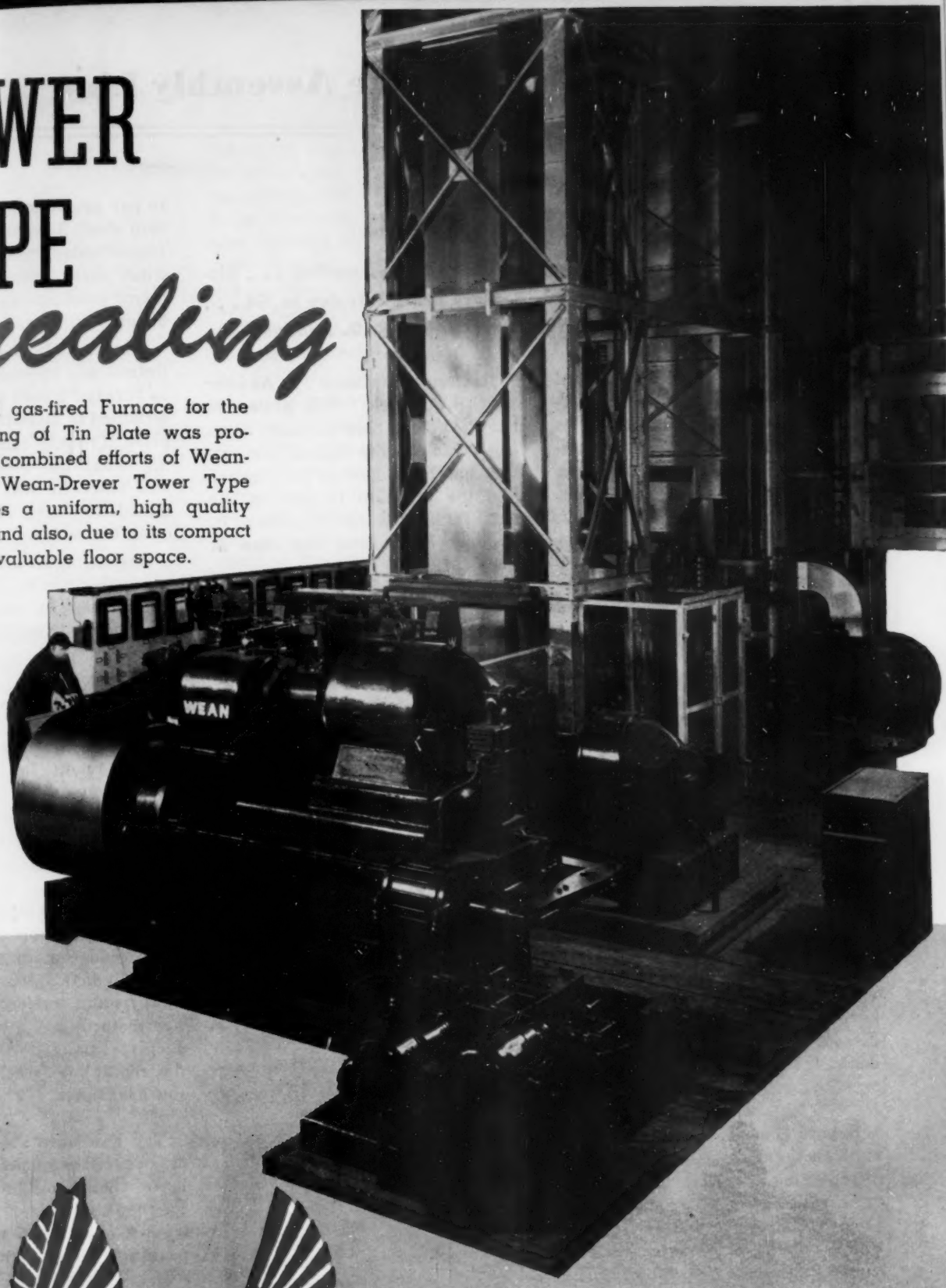
New Prexy . . . SERVICE TOOLS INSTITUTE has elected Martin M. Tveter, vice-president and director of Duro Metal Products Co., Chicago, as its president.

Association Formed . . . A new manufacturers' association, the INSTITUTE OF ENVIRONMENTAL EQUIPMENT MANUFACTURERS, has just been organized. Institute headquarters will be at 30 Church St., New York.

OWER YPE *nnealing*

first successful gas-fired Furnace for the inuous annealing of Tin Plate was pro- d through the combined efforts of Wean- er engineers. Wean-Drever Tower Type ealing produces a uniform, high quality ealed product and also, due to its compact gn, conserves valuable floor space.

Wean engi- again have n their leader- as Specialists heet, Tin and Mill Equip-



The

WEAN ENGINEERING *Company, Inc.*
WARREN, OHIO

Dealers Sob for Bigger Margins

Auto sellers claim overproduction saturates market . . . Discounts cut profits to bone . . . More price cuts due in '54 . . . But customers may not feel benefits—By *R. D. Raddant.*

Not since the late Henry Ford found himself in straitened circumstances back in the twenties and unloaded all his auto production on his dealers has there been such a clamor from auto salesmen.

Almost without exception they charge that overproduction at the factory has saturated the market and that dealers themselves are absorbing the brunt. They contend that, in their parent companies' battle for position, they are being victimized by being forced to accept small or negligible profits for pushing cars into the market.

How About '54? . . . It boils down to a cleanup situation where discounts are given so freely that a buyer who pays list price just lacks enterprise. If the situation is bad now, what is it going to mean in terms of 1954 auto prices, sales and production?

Prices will be in for the closest scrutiny. As a matter of fact, auto buyers for some time have had the benefit of lower prices under the discount policies forced on most dealers since late summer and even before.

Buyers Benefit Little . . . Last week on the date of its new model introduction, Chrysler announced prices cuts ranging from $27 to $169. Others, particularly those which did not make radical changes for 1954, may follow suit.

Actually, price changes in a discount market don't necessarily mean a great deal to the auto buyer. A price change may mean that some of the dealer's margin is restored while the selling price remains at the same comparative level. In today's market, there is plenty of pressure to do something about this margin.

Dealers Want More . . . Answer to the question "Will prices be cut?" is that they already have. But dealers claim that all the cutting has been done at his expense and the pressure is now on the manufacturer to absorb some of it, as may have been the case at Chrysler.

Not all automakers will cut their prices. Some are sure that their 1954 models will be in good demand and will maintain excellent sales records without any price paring.

However, there is some reason to believe that manufacturing costs will be lower in 1954. There are some excellent areas where costs will be cut and few where production costs necessarily will increase.

Bars Go Crazy . . . Most obvious place where costs will be lower is perhaps the most basic—the price of steel. No automaker will have to pay premium prices for conversion steel. Secondly, the steel purchaser today finds himself in somewhat same discount market for many products as does the auto buyer.

VERTICAL parking made possible by Simmons Industries' Sky-Park hydraulic machine that raises two cars, leaves room for two more underneath.

For example, the bar market in Detroit was recently characterized as "crazy." Every supplier was determined to meet the competition's price. Trouble came in determining what the competitor's price was since he was equally determined to meet any competitive offer himself.

Easing of nickel will cut costs, particularly in brightwork plating. Substitutes in most cases were more costly than pre-Korea brightwork.

Robots Pay Off . . . New automated equipment, in spite of the tremendous expense it involves, should result in lowering some production costs. Labor itself is tied to the escalator clause and should remain static or nearly so unless the cost-of-living index rises sharply.

Going back to steel, the fact that it is in good supply will result in some reduction in manufacturing costs. In days of extreme shortage, quality and uniformity were unheard words in Detroit and manufacturers paid another premium in die repair and other manufacturing headaches.

Try For More . . . Manufacturers are still determined to turn out better than 5 million cars in 1954. Factory sales for the first 9 months of this year were 4,827,449 passenger cars, indicating that it will take a fairly good year and a lot of salesmanship to move them.

Early in 1953, GM President Harlow H. Curtice predicted his company would gross better than $9 billion in sales this year.

Reports on the first 9 months indicate that this mark will be easily passed before the end of December. Total sales for the first three quarters reached $7,931,000,-

000, higher than any full year in GM's history.

What GM Made . . . This figure is even more remarkable when it is recalled that the Detroit Transmission fire on Aug. 12 virtually stalemated production of Cadillac, Pontiac, and Oldsmobile divisions until substitute measures could be taken to replace Hydra-Matic transmissions.

Net income from total sales reached $453 million, or 5.7 pct of sales, after provision of $1,006,000,000 for U. S. and foreign income and excess profits taxes. In 1952 net income for the first 9 months was $387 million based on net sales of $5,564,000,000.

Defense Work Up . . . The report at the end of the third quarter indicates the full extent of the production rate maintained by the auto industry as well as manner in which GM was able to capitalize on it in gaining increased shares of the market.

In spite of general defense cutbacks, GM's defense deliveries were 31 pct greater in the third quarter and 36 pct greater in the first 9 months of 1953 than in corresponding periods last year. Defense accounted for 18 pct of GM sales so far in 1953.

The Detroit Notebook . . .

Notes picked up around Detroit's auto plants last week:

▸ Annual inventory in most of the Ford Rouge plants will be completed in a brief 24-hour period. Inventory for these plants was scheduled for Friday, Oct. 30, with plants resuming production Monday, Nov. 2. Necessity of maintaining production schedules, adoption of improved inventory methods and careful scheduling accounted for the fast count.

▸ GMC Coach & Truck Div. has developed an exhaust system that makes exhaust noises "inoffensive to the human ear." A special name, "Silent Power," was originated for the system of new mufflers and exhaust pipes. Mufflers are a reverse-flow type, larger and more rigid. New exhaust manifolding and larger exhaust pipes are used in the system. Different systems had to be developed for each GMC engine because of the different volumes of noise.

▸ A special projects group has been organized within Ford's Engineering Staff to research the field of body design. The company has assigned creative talent to the group since one of its objectives is the establishment of engineering "firsts" for the company.

▸ Buick's penetration of the low-priced market this year has brought it closer to third place in the industry. Buick at the end of the first 8 months of 1953 was 21.5 pct behind third place compared with 31.7 pct under the controlled production of 1952. Third place is Plymouth, in case anyone didn't know.

▸ Chrysler used the greatest newspaper advertising campaign in its history in conjunction with the Chrysler new model announcement—more than 3300 papers.

▸ One of the notable features of the 1953 season is the way purchasers have ordered extras. At Oldsmobile, for example, 54 pct of buyers ordered power brakes; 52 pct bought tinted glass; 40 pct power steering, and 30 pct Autronic-Eye headlamp control.

Automotive Production
(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Oct. 31, 1953..	130,676*	15,278*
Oct. 24, 1953..	129,765	20,029
Nov. 1, 1952..	122,888	32,149
Oct. 25, 1952..	113,114	31,633

*Estimated. Source, *Ward's Reports.*

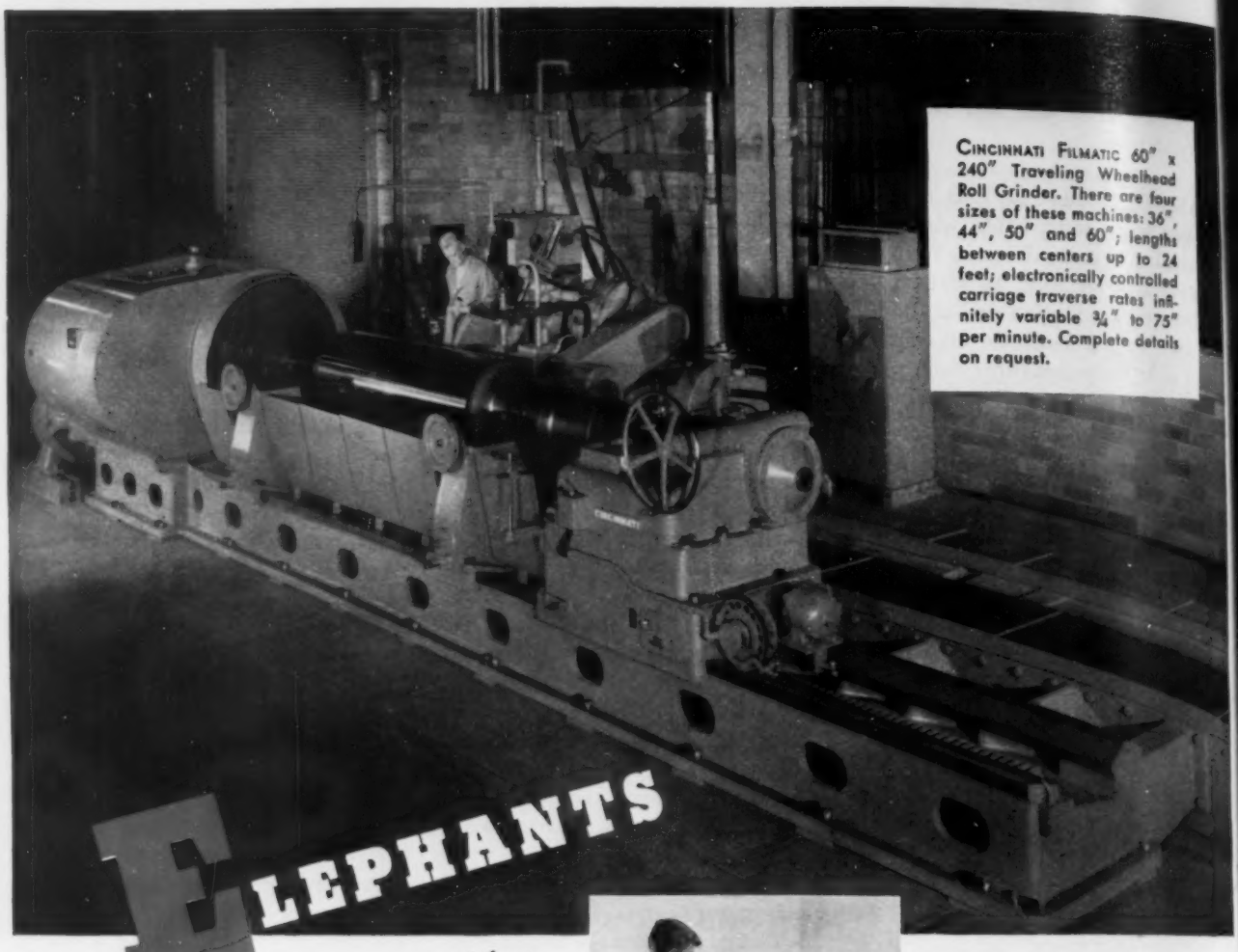
Lightweight Power Steering

Ainsworth Manufacturing Corp. of Detroit is the newest entry to the power steering field, unveiling a new unit that weighs only about half that of most of the competitive units.

The unit, an integral type of power steering, employs a direct action principle eliminating racks and pinions. Ainsworth is in the process of negotiating for a major customer and will tool up when a market is assured.

THE BULL OF THE WOODS — By J. R. Williams

FORTY-TWO YEARS IS A LONG TIME--I'LL NEVER BE ABLE TO ADJUST MYSELF TO IDLENESS!
DON'T TAKE IT SO HARD, ROSS, YOU'RE IN FINE HEALTH AN'--
YOU LIVE ALL YOUR YOUNG LIFE TO RETIRE AND ALL YOUR OLD LIFE DREADIN' IT! I EVEN DREAD TO WITNESS ONE!
WHEN YOU'RE YOUNG YOU'RE PERFECTLY ADJUSTED TO LOAFIN' BUT HAVE TO WORK-- THEN YOU GET PERFECTLY ADJUSTED TO WORK BUT HAVE TO LOAF! WHAT'S LIVIN'?
11-6 J.R.WILLIAMS
THE READJUSTMENT
Copr. 1953 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off.



CINCINNATI FILMATIC 60" x 240" Traveling Wheelhead Roll Grinder. There are four sizes of these machines: 36", 44", 50" and 60"; lengths between centers up to 24 feet; electronically controlled carriage traverse rates infinitely variable ¾" to 75" per minute. Complete details on request.

ELEPHANTS and Rabbits

CINCINNATI

of precision grinding machines bear a familiar name plate

It takes long experience and extensive design and research facilities to build the elephants and rabbits of precision grinding. Cincinnati Grinders Incorporated have been doing it for over 25 years . . . they have the background and facilities for this type of work. Two examples of CINCINNATI FILMATIC Grinding Machines are illustrated here, a 60" x 240" Traveling Wheelhead Roll Grinder, weighing 149,500 pounds . . . about 45 times the weight of the No. 0 Centerless Grinder. Products ground by CINCINNATI FILMATIC centertype and centerless grinding machines range from surgical sutures .004" diameter, to steel rolls 60" diameter . . . 15,000 times as large and 665,000,000 times as heavy. Our engineering and shop facilities are at your service to equip your shop with any type of centertype, centerless, or special grinding machine for the lowest cost of production.

CINCINNATI FILMATIC No. 0 Centerless Grinding Machine. Catalog No. G-576-2.

Capacity: work diameter	0 to ½"
length, thrufeed	5"
infeed	4"
Grinding wheel	14"x4"x5" hole
Infinite regulating wheel speeds	35 to 320 rpm
Main drive	2 hp

FILMATIC

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO
(Subsidiary of The Cincinnati Milling Machine Co.)

Budget May Test Ike's Influence

Balancing fiscal '55 has just about been abandoned . . . But 1956 budget could lead to tussle . . . Foreign aid, military programs will be main targets—By G. H. Baker.

Although the Eisenhower Administration has just about given up all hope of balancing the federal budget prior to fiscal 1956, several influential congressmen believe firmly that the next fiscal budget can—and will—be trimmed to income levels.

Result of these divergent views may well be a basic test next year of the extent to which the White House can influence the Congress on basic political questions. At this time, the odds—judging by public opinion polls—seem to favor President Eisenhower. But there are some strong political factors to be reckoned with on Capitol Hill.

Must Balance Budget . . . Chairman Taber, R., N. Y., of the House Appropriations Committee, says a balanced budget next year is mandatory if future inflation is to be avoided. His views are backed up by Senator George, D., Ga., who personally favors drastic cuts in defense and foreign aid spending as devices for bringing spending into line with federal income.

Foreign-aid spending is the "real area" where spending cuts may be effectively executed, as Sen. George sees it. He points out that global assistance programs are costing U. S. taxpayers around $6 billion this year.

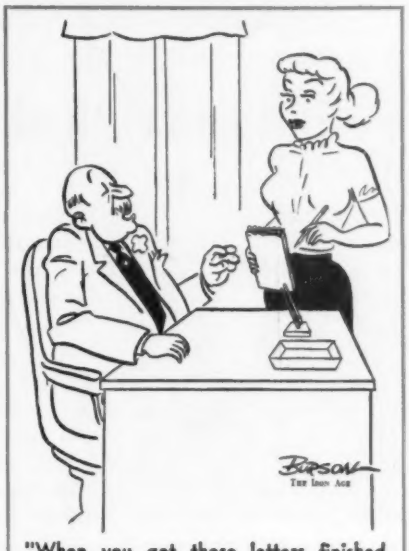
Leadership Is Fact . . . Any such drastic reductions in military programs or in foreign aid are bound to stir up spirited opposition from Administration leaders. Says Roger M. Kyes, Deputy Secretary of Defense: "It is of little use to complain that the United States never asked for its present role as the leader of the free world.

"It would be a waste of time to look back at the 'good old days' when this country had little connection with, and less interest in, the problems and headaches of the world beyond its shores.

"Our role as the leader of the free world is a fact born of the principle that 'to whom much is given, of him much is expected.' "

Development Must Go On . . . Basic Administration philosophy on military and foreign spending is that the U. S. is today irrevocably committed to a defense economy, and will remain in this state for years to come. This belief includes the principle that development and production of defense weapons must be continually pushed.

Such a principle is, however, regarded with suspicion by congressional circles which hold that considerable reductions may be effected in the procurement of conventional weapons. These circles point out that Congress has appropriated sufficient money for interceptor planes, guided missiles, and a nation-wide radar screen—all geared to prevent a possible atomic or hydrogen bomb attack.



"When you get those letters finished, Miss Jones, type out a list of New Year's resolutions."

Cut Shell Output . . . Limited, not sharp, cutbacks in ammunition production lie ahead. Army Ordnance officials estimate that shells are now rolling off production lines at the rate of $260 million worth every 30 days. Reserve stocks are getting healthier than ever before in Army history.

Ordnance plan is to stretch out, not cancel, existing ammo contracts. Plants are to be kept in operation as long as possible.

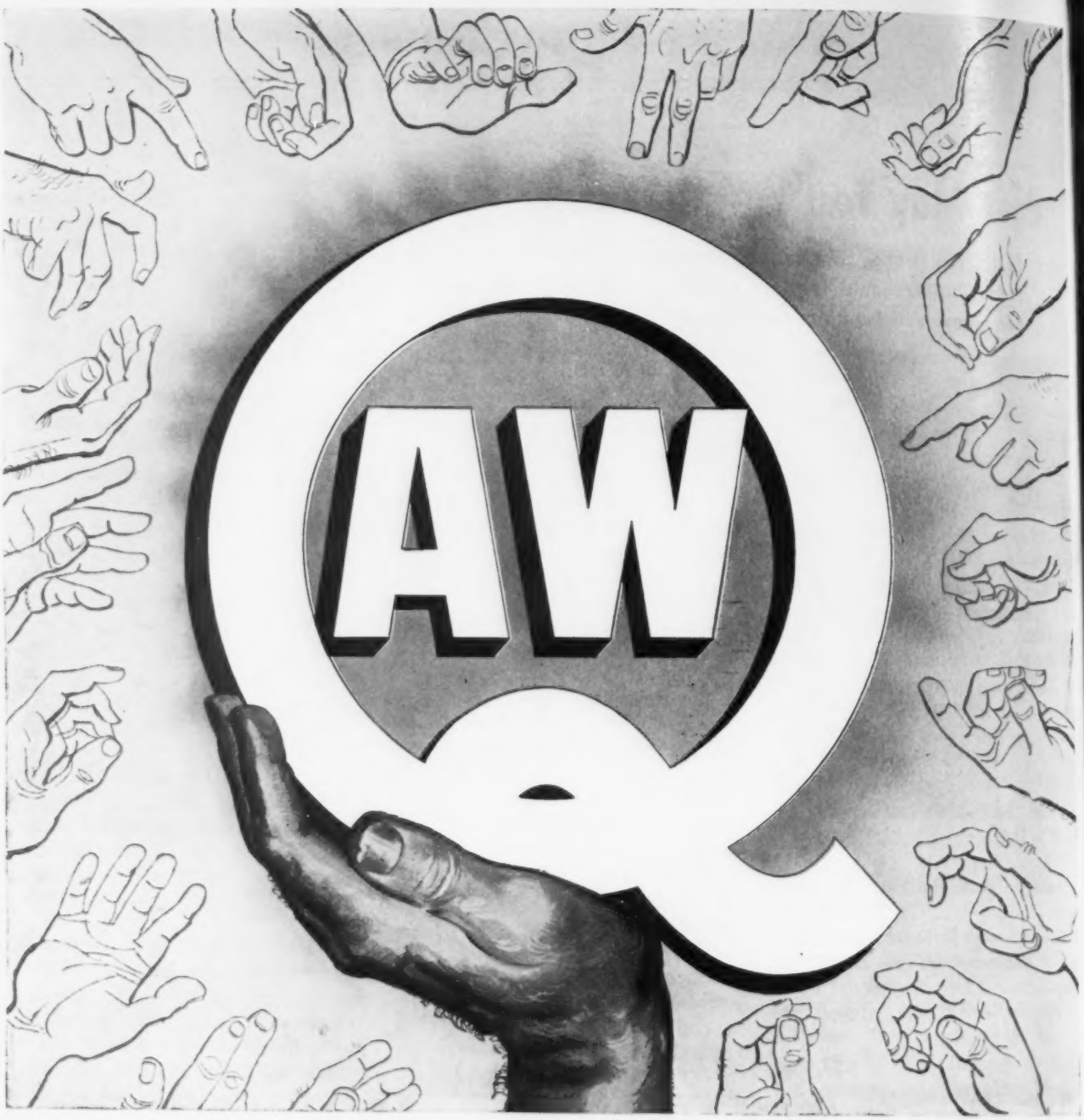
Beginning next year, monthly output of shells is to begin a gradual decline. Under present plans, dollar value of monthly shell output will probably drop to around $200 million by mid-year, and to about $170 million by Jan. 1, 1955.

IMC Now Inactive . . . Easier supply situation in most of the world's scarce materials has resulted in the assignment to "standby" status of the International Materials Conference's Central Group. The action, which became effective October 23, follows the dissolution of Manganese-Nickel-Cobalt Committee—the last active commodity committee.

But IMC makes it clear that it does not by any means regard the world nickel supply as being plentiful. The outlook is not bright.

Teetor In Post . . . Secretary of Commerce Sinclair Weeks has administered the oath of office to Lothair Teetor, an Indiana business executive, as Assistant Secretary of Commerce for Domestic Affairs.

Since the beginning of October, Mr. Teetor has been serving as special consultant to Secretary Weeks.



Symbol of 1600 hands that know how

Hands pledged to a common cause — hands that are skilled at their job and devoted to building top quality into every weldment. Hands of the metallurgist, of engineers and management — most important, hands that do the welding, the shaping, the machining and the inspecting — these are the hands that spell out the meaning of AWQ — American Welding Quality.

We know of no better guarantee of quality than a skilled worker with a sincere desire to do his best. This is the know-how, the care, the quality that American Welding offers you.

If your products involve either fusion or resistance welding of ferrous or non-ferrous metals, let us study your problem. We can apply over a third of a century's experience to your requirements — backed by 1600 hands that know how.

A company you'll like to deal with

THE AMERICAN WELDING & MANUFACTURING COMPANY • WARREN • OHIO

TARIFFS: Bitter Fighting Begins

Foreign Economic Policy group starts preliminaries . . . Industry, labor, others take sides . . . Protectionists ask Randall's resignation . . . AFL favors lower levies.

Battle lines are being sharply drawn in preliminary skirmishes which forecast a bitter fight on international trade and tariffs during the coming session of Congress.

Industrial, labor, and other groups, as well as individuals, began choosing sides last week during the preliminary hearings which started a survey by the Foreign Economic Policy Commission, headed by Clarence B. Randall of Inland Steel Co.

This 17-man commission was authorized by Congress to make a study of American foreign trade policies and report back to the White House and Congress with recommendations. It is composed of businessmen, congressmen, and other officials.

Ask Randall to Quit

Next week, a subcommittee of the group moves its base of operations abroad and will hold its first meetings in Paris.

A clear indication that some are afraid that the commission will eventually recommend lowering of trade barriers is seen in demands being made by protectionists that Mr. Randall resign.

On the other hand, strong pressure will be brought by influential organizations representing industry and labor, some agricultural groups, to have Congress relax present trade restrictions.

Signs are that Congress won't be easy to convince, even though it is no secret that the Administration would like to see increased trade between this country and others.

A strong congressional bloc, including members from various mining districts, are getting set to do battle against any such moves.

Typical of this school of thought is Rep. Richard M. Simpson, R., Pa., who told a protectionist group last week that Congress hasn't any intention of enacting any policy which would loose a flood of imports into this country.

Lined up on the side of relaxing present trade barriers is the United States Chamber of Commerce, strongly supported in its stand by the international group.

Decision was closely split but the National Chamber recently adopted a resolution in favor of not only continuing the reciprocal trade program but expanding it.

Also linked with the advocates of relaxed trade barriers is the American Farm Bureau Federation. President Allan B. Kline contends that not only would lower tariff levies help stabilize world prices but aid in disposing of farm products, now piling up in warehouses.

A surprise to some, the American Federation of Labor has joined the forces for fewer import restrictions. Head man George Meany relies on reports by economists which purport to show that major surgery on present tariff levies would affect no more than 300,000 jobs. Some studies indicate the figure nearer to 50,000.

On the other hand, the AFL head believes the continuation of tariff levies at present levels will seriously curtail American trade, thereby having a serious bearing on at least 3 million jobs.

So far, advocates of the protectionist policy have not raised much outcry, perhaps thinking it is not yet time to do so. However, other groups advise caution.

Admitting there probably would be "dislocations" in some domestic industries, mostly small ones, the Committee for a National Trade Policy believes that it would be better for the taxpayer in the long run to subsidize those industries until they can make the transition.

Revision Is Due

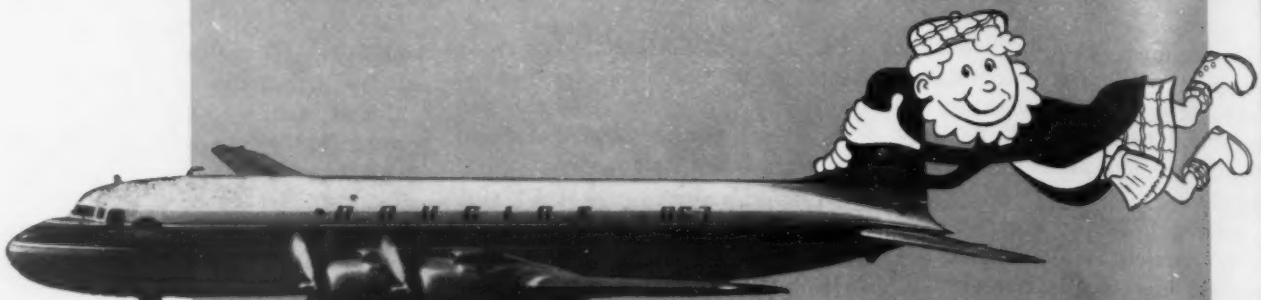
Also, the Committee for Economic Development agrees that revision of policy should be made. But it recommends that any actual tariff reductions should be gradual, and very selective in nature.

Elder Statesman Bernard Baruch sent word to the FEP Committee that while it is his belief that revision of policy is due, irreparable harm could result if Congress lets itself be stampeded into letting American trade policies become the whipping boy for world trade ills.

BEFORE giving a talk favoring more liberal U. S. trade policies at a meeting of Committee for a National Trade Policy last week, Henry Ford II chatted with John Coleman, committee chairman (center), and David Rockefeller.

The fastest piston-powered

COMMERCIAL AIRLINER *in the world....*



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Every time one of these sleek, powerful, 365 miles-per-hour DC-7's takes off, Washington MicroRold Stainless Steel rides along. Every flight — every floating voyage down the skies — finds us there, in happy company with 69 comfortable safe passengers. Douglas, you see, demands dependability . . . strength . . . highest quality . . . and we make MicroRold Stainless Steel to meet those rigid demands.

Thinness control, quality control, and consistency — all of these make MicroRold a vital part of the DC-7!

The "fly-word" of Douglas is dependability. One way to get dependability is to buy Washington Steel Corporation's MicroRold Stainless Steel Sheet and Strip.

Washington Steel

CORPORATION, WASHINGTON, PENNSYLVANIA

Competition Cuts Steel Mill Output

Softening bar, structural market forces some Coast mills to reduce operations . . . Workers laid off as some furnaces, rolling mills go out of production—By T. M. Rohan.

Return to a competitive market and softening supplies in some items are having their effects on West Coast steel mill operations.

U. S. Steel's Geneva mill and Kaiser's Fontana mill continued to operate at near and above rated capacity. In the intermountain area Colorado Fuel & Iron was going full blast with hot demand for new seamless tubing.

Layoffs Bring Walkout . . . Operations at bar and structural mills were in sharp contrast. In Niles, Calif., Pacific States Steel Co., largest independent West Coast producer, had a wildcat walkout of its total labor force of 700 when it attempted to cut down operations from 72 pct.

AFL and CIO workers went into continuous union meetings over the reduction in force which would have laid off about 72 men. Inventory had been accumulating with two of three furnaces in operation and the firm planned to cut to one furnace but increase ingot size from 12 in. to 18 in. or 2500 lb to about 7500 lb using a top pour instead of bottom pour.

President Joseph Eastwood said the walkout would probably be prolonged. Some modernization will be attempted during the down period including installation of pyrometric controls and overhaul of mechanical equipment.

Cut Furnace Operation . . . Another independent San Francisco area producer was doing below normal business with two turns daily and some Saturday work. U. S. Steel's Pittsburg, Calif., mill is operating three of five furnaces.

In Seattle, Bethlehem announced a cut to about 71 pct operations with layoffs of 250 of the plant's 1400 workers. The firm's 22-in. mill has a heavy order backlog of universal plates, tie plates and larger structurals and will continue full operation.

But backlog of reinforcing bars and small structurals has dropped off, necessitating cutback on the 12 in. mill. End of the construction season in Alaska and Pacific Northwest is major reason. Fabrication operations will be unaffected.

Isaacson at Seattle is making steel principally for its own forge shop and Seidelhuber has been out of operation for months.

Most Rates Lower . . . In the Los Angeles area, except for Kaiser, operations are reduced. One mill is running only half its furnaces, holds those to a 4-day week. Two more mills are in somewhat higher production.

Construction starts on new Ford assembly plant at Milpitas, Calif., as E. F. Gohl, vice-president in charge, Bethlehem Pacific Coast's Fabricated Steel Construction Div., tightens nut on anchor bolt for first column.

Western ingot production last week was 98.3 pct of rated capacity, this week scheduled for 95.3 pct. But on a mill-by-mill average, excluding integrated mills, operating rate is no more than about 60-70 pct.

Biggest Yet . . . Chrysler's Los Angeles assembly plant expansion is expected to make it the largest auto plant in an area which currently makes more cars (624,000 in 1953) than any area outside Detroit.

Two new assembly lines handling all four Chrysler Corp. models will replace the existing single line. Operation is scheduled to start in early 1954.

A new body finishing plant will also be installed in space now devoted to subassembly of Douglas C-124 Globemaster transports. Eventually, parts will be flat-shipped from Detroit, replacing finished bodies now received from there and the San Leandro plant.

The Los Angeles plant last year turned out 50,044 cars, more than doubling 1951 operations in the state. Total output for the two in 1952 was 114,009 with 125,000 expected this year.

Aluminum Cutback . . . Inventory accumulation of aluminum sheets by manufacturers and distributors brought a layoff of 300 of total 3000 workers at Kaiser's Trentwood, Wash., sheet rolling mill last week.

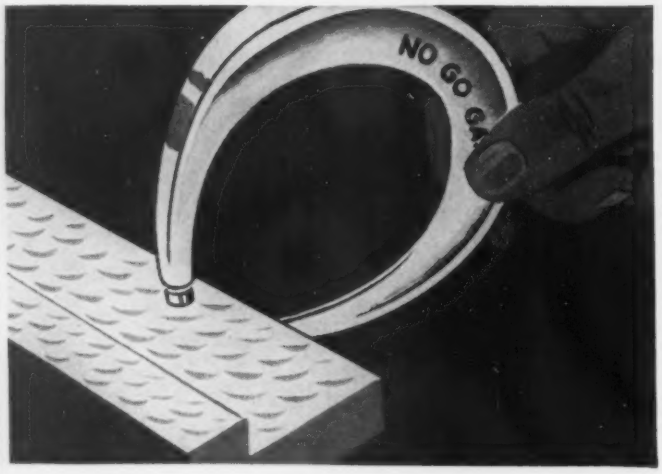
Employment is still over the 2150 level last January.

Ship Alaskan Tin . . . Largest shipment of tin ore to be produced in North America came into Seattle last week via steamship from Alaska. The shipment from Northern Tin Co. included 75 tons of tin ore concentrates produced at York on the Seward peninsula, 100 miles from Siberia.

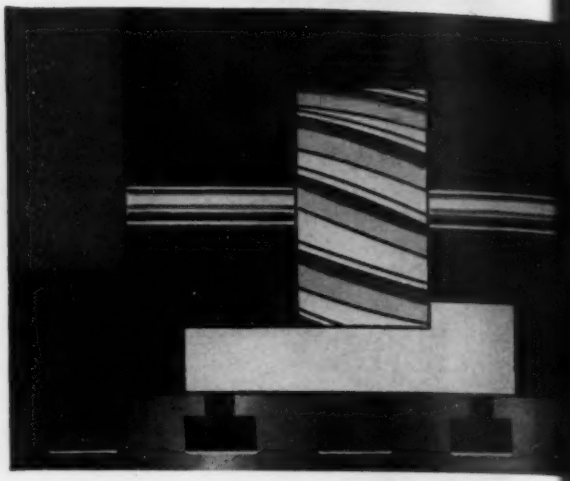
Ore was carried in 85 oil drums bound for Texas City, site of the only U. S. tin smelter.

HOW TO END DAMAGED WAYS, PRODUCTION LOSSES

Sunoco Way Lubricant Stops "Jumpy Table"

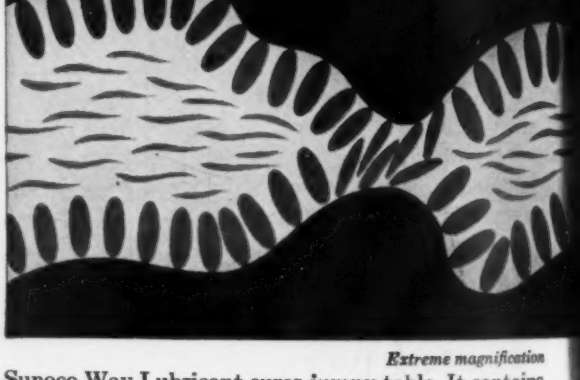


Tool chatter and jumpy table are machining headaches. Too often they cause poor surface finish, failure to hold tolerances, production losses.



Tool chatter is a result of a lack of rigidity in either the machine or the set-up. It is a mechanical problem and no lubricant can lick it.

Jumpy table is a stick . . . slip . . . stick . . . slip action of the table. It is a lubrication problem. Though just as damaging as tool chatter, it is not always detected when the cause of poor surface finishes.



Extreme magnification

Sunoco Way Lubricant cures jumpy table. It contains special compounds that form a film, like the nap of a rug, on the sliding surfaces and minimize the force of both static and kinetic friction.

Why take a chance of damaging your ways? These integral parts of the base casting for your machine are difficult to refinish and costly to replace. For information about Sunoco Way Lubricant, call a Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. IA-11.

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Civilian Orders Cushion Defense Dip

Output this year will approximate 1952 production . . . But higher shipments and lower orders have trimmed backlogs . . . BDSA hears machine tool problems—*By E. J. Egan, Jr.*

Present indications are that U. S. production of machine tools in 1953 will approximately equal the 1952 figure. Shipments may run slightly ahead of last year, reflecting the completion of defense equipment on which production was started in 1952.

For the first 9 months of 1953 shipments were 11.1 pct above the comparable period last year. However, new orders at the three-quarter mark for 1953 were 16.8 pct below last year's total for the same period.

The new order drop, resulting from a slowdown in defense buying, has been cushioned to a large extent by an encouraging demand for tools to be used in civilian production. The sustained volume of this non-defense buying indicates a growing awareness of the need for modern machine tools in an era of highly competitive business conditions.

Have 7-Month Backlog . . . At the end of September the backlog for the machine tool industry stood at 7 months' production. During the Korean emergency this backlog reached a peak of 23 months, but customers can now be assured of normal delivery for most types of equipment.

The machine tool industry hasn't wasted any time in bringing a few of its knottiest problems to the attention of the newly created Business & Defense Services Administration, successor to the former National Production Authority.

Sound Off . . . Meeting recently with officials of the BDSA in Washington, the Machine Tool Manufacturers Industry Advisory Committee made known their feelings on several subjects of prime concern to the industry.

First recommendation by the Advisory Committee was for a prompt revision of government order M-41 to permit manufacture of a greater share of machine tools for non-defense purposes. The order now provides that builders deliver 60 pct of their output to fill defense rated orders for one classification group, and 40 pct for non-rated orders.

The committee urged reversing these percentages, in view of the recent sharp drop in defense orders. At the same time it recommended that the so-called "critical list" of machine tools be eliminated entirely.

Should Keep Order . . . Several other proposals were made for revision of the M-41 order, but the committee was unanimous in agreeing that the basic order should be maintained under present industry conditions. BDSA agreed to give immediate consideration to these suggestions from the advisory group.

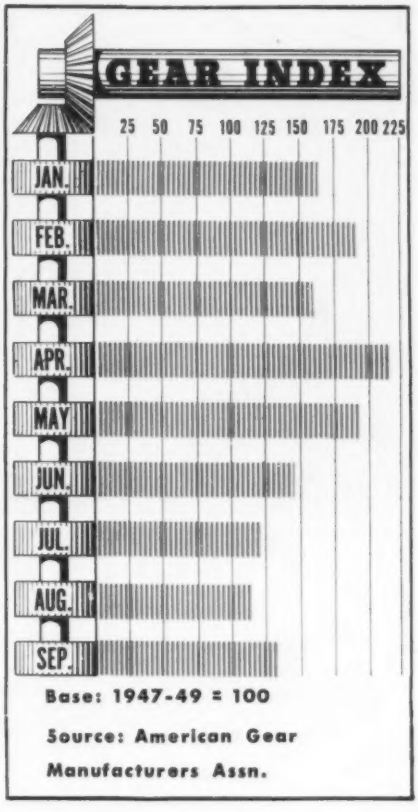
Switching to another industry problem, the committee told BDSA officials that since the outbreak of hostilities in Korea, American machine tool builders have lost their once lucrative foreign markets. Some members of the committee said the industry would oppose any proposed cut in the U. S. tariff on machine tool imports.

To Study Imports . . . It was suggested that the BDSA undertake a study of the impact of foreign tool imports on the domestic machine tool industry. BDSA officials said this matter would also receive immediate consideration.

The committee registered strong opposition against the leasing of government-owned machine tools for other than defense purposes. The industry group also objected to the sale of these tools by the government.

Exhibit Boring Methods . . . Established recently in Bremen, Germany, the Boring & Trepanning Assn. will demonstrate its deep hole drilling methods next month to American industry. First showing of BTA equipment in the U. S. will be held at the American Boring & Trepanning Co. plant at Centerline, Mich., about Nov. 16.

Approximately 225 delegates and visitors attended the 4-day Semi-Annual Meeting of the American Gear Manufacturers Assn. in Chicago last week. Active committee groups, meeting regularly throughout the session, reported considerable progress in their continuing efforts to improve the technical standards of the gearing industry.



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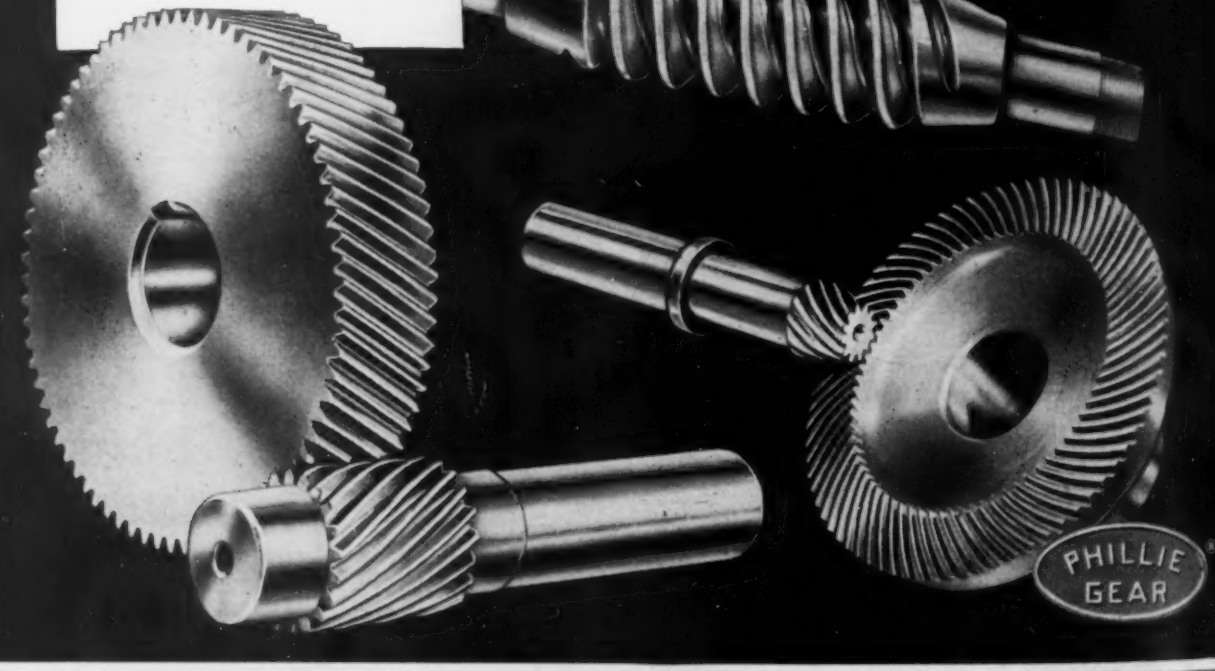

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REPORT TO MANAGEMENT . . .

Price structure stable

Key your production, purchasing policies to the conclusion that nowhere in evidence is a significant change in the price structure of the economy. Prices of raw materials have been undergoing mild deflation. Industry's wholesale prices have crept up over the past year but have been remarkably stable. Meanwhile the cost-of-living index registers just-perceptible gains.

A quiver triggers headlines

Even the slightest quiver of the cost-of-living index unlooses cross-country headlines. You saw it happen again last week when the index edged up a skimpy 0.2 of a point to 115.2 for September. For the 12 months through August '52, the index rose only 0.9 of a point while retail cost of all commodities declined 1.6 points. Increasing almost 7 points in that period, rent managed to burst some of its controls bonds, fueled the living costs rise.

How are wholesale prices?

Main focus of industry should turn to price trends of manufactured commodities which in the past year have risen only fractionally despite high, fixed labor and other costs. Bureau of Labor Statistics calculates wholesale costs of industrial commodities have increased from 113 in August '52 to 114.8 last August. Almost across the board, manufacturers have reluctantly imposed minor price hikes at the risk of losing competitive advantage. Bustling competition should restrain industry's desire to improve too slim cost-profits ratios by hiking prices. Conversely, high costs narrow the leeway for price cutting.

Favor short-term buying

Still in process of downward adjustment, with conservative buying policies in strong evidence, inventory movement was having little influence on prices. National Assn. of Purchasing Agents favors short-term commitments, reports lack of confidence in the general price structure. This lack of confidence may foster an even harsher buying attitude on raw materials.

High wages here to stay

Bemoaning wage rigidity installed into the economy, The Guaranty Survey blamed on it a loss of flexibility to reduce prices in the face of downturning demand. It cited "peculiar" price tendencies of the past 2 years. Wholesale prices of manufactures held reasonably stable while consumer prices rose. Reason: Products using more labor have shown increasing price spreads as compared with commodities at earlier stages of production. But like it or lump it, high labor costs are now permanently industry's burden and can't be shed unless depression hits. Intensified mechanization may later offset them, unions permitting.

Workweek dips 1 hour

Average workweek of production workers fell to 39.6 hours in September--a dip of almost 1 hour from August. Though $1 over last year, September average weekly earnings of the factory worker were $70.49, slightly under August. The nearly 14 million factory production workers earned in mid-September an average of $1.78 per hour, including premium pay. From August the increase was 1c, caused mainly by cost-of-living index payroll adjustments. For the year, hourly earnings had advanced about 4c per hr over 1952. Employment continued at record.

How business goes

On the production front, business failures for the week ended Oct. 22 jumped to 185 from 169 the previous week. Business failures in September were 27 pct greater than a year ago. Revenue freight loading for the week ended Oct. 17 were just a shade under a year ago but 18,469 cars higher than the preceding week. August factory shipments of truck-trailers totaled 9741 units worth $25 million, a 5 pct drop in numbers but a 2 pct rise in value from July.

This Limit Stop not only *disconnects* the motor from the line, but *stops* the motor quickly. On D-c cranes, where high hoisting speeds prevail, dynamic braking aids in bringing the hook block to rest.

Since this Limit Stop is operated directly by the hook block, stretching of the hoisting cables does not affect the tripping point. By removing the fear of an overhoisting accident, the YOUNGSTOWN Limit Stop enables the crane operator to do better work.

*A crane *without* a Youngstown is as risky as a boiler *without* a safety valve.

Easily applied to both new and existing A-c and D-c Cranes.

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E & M

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Proportionately, that's an understatement! A wedding ring as big as 17.625" outside diameter would be about four times as thick as the actual 0.375" section of these thin KAYDON bearings... and even the finest watch parts, enlarged proportionately, probably would not have the precision tolerance to which these bearings are consistently finished. • These are by far the thinnest ball bearings ever made in this large diameter. KAYDON has developed the facilities and special techniques vital to such precision production.

Precision miracles in extremely large bearings of unusually thin section have become routine achievements at KAYDON. In addition to unique thinness that conserves space and weight, other outstanding features have been embodied in many special KAYDON bearings ... for instance: Flame hardened bearing races drilled, tapped and gear-cut by the KAYDON process eliminate costly auxiliary parts, help improve machine design and performance, and make possible more compact, lighter machines of greater capacity.

For unusually large, light weight, thin section bearings, contact KAYDON of Muskegon.

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KAYDON Types of Standard and Special Bearings:
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Continued

Cement kilns

A pocket-size 3 color brochure containing 30-p. of text and illustrations has been issued by Kaiser Aluminum & Chemical Sales, Inc. Entitled *Basic Hot-Zones for Cement Kilns,* the instructional brochure describes the installation of refractory brick in cement kilns from standpoint of experience gained from installations made throughout the nation. *Kaiser Aluminum & Chemical Sales, Inc.*

For free copy circle No. 12 on postcard, p. 139.

Voltage regulators

Rocking Contact Voltage Regulators for DC Machines is the name of new leaflet released by Allis-Chalmers Manufacturing Co. The leaflet covers the construction, operation, installation and advantages of Rocking Contact voltage regulators for dc machines. A chart shows the approximate applications of the 4 available types of Rocking Contact voltage regulators. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 13 on postcard, p. 139.

Grinding and polishing

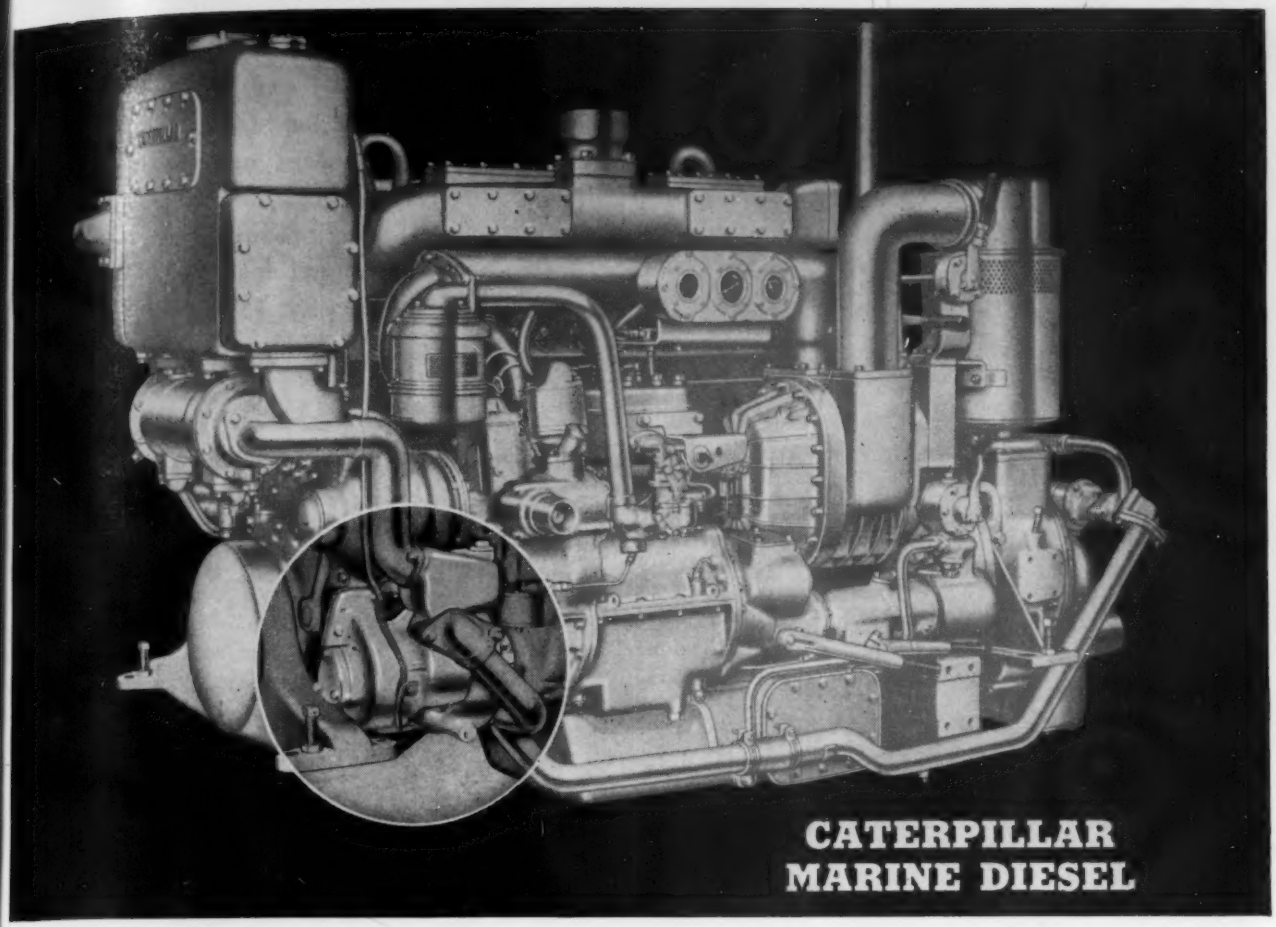
New Adapt-a-belt for use on a wide variety of grinding and polishing operations has been produced by Curtis Machine Corp. It is intended for use as a portable grinder attached to an air outlet or to clamp on lathes, milling machines, drill presses or pedestal grinders to do work quickly on jobs that do not warrant setting up a machine. Data is given in new brochure available without cost. *Curtis Machine Corp.*

For free copy circle No. 14 on postcard, p. 139.

Drum handling

A mechanical device designed to engage, transport, place and tier any conventional-type drum without the use of pallets or dunnage has been produced by Lewis-Shepard. Called the Liftomatic drum handling attachment, this unit is designed to speed any drum handling operation. The unit is quickly detachable. *Lewis-Shepard.*

For free copy circle No. 15 on postcard, p. 139.



National Bearing Castings Help Cool "Cat" Engines

National Bearing Division's foundry skill permitted a new design in pump efficiency and compactness.

This extremely compact 170 horsepower Marine Diesel Engine, with special coolant pump, is a new design in efficiency by Caterpillar Tractor Co., Peoria, Illinois, makers of famous "Caterpillar" Diesel Engines, Tractors, Motor Graders, and Earthmoving Equipment.

Unusual size restrictions were specified in the coolant pump housing. It had to be of tough, durable bronze, highly resistant to corrosion by raw sea water, and painstakingly cast as the housing component for a very compact coolant pump, capable of delivering 100 gallons per minute. The housing casting design was unusually intricate, with wall thicknesses exactly ¼" in some areas, 7/32" in others. The mold for each casting required *14 cores*—all perfectly positioned, as the slightest misalignment would be ruinous. And, housings had to be cast to minimize machining.

"Caterpillar" selected National Bearing Division to provide these special bronze pump housings. We were chosen for proven ability to produce top quality castings, our unique core facilities, and our experience in applying over 50 years of specialization to customers' problems.

Our bronze pump housing castings met—and continue to meet — "Caterpillar's" specifications for quality, tolerance, and minimum machining in every respect.

If your product includes copper, bronze, or other copper-base castings, it will be worth your while to investigate National Bearing Division. We produce copper-base castings, large or small, with any degree of finish, to precision specifications. And, because we are set up for production runs, we can probably save you dollars.

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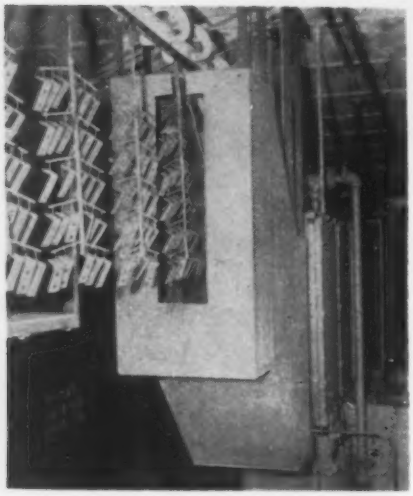
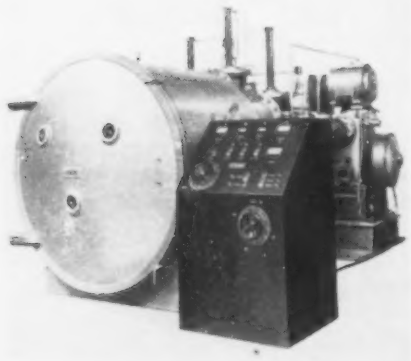


Radiant heat speeds drying of metal parts

An inexpensive far-infrared electric heating installation has speeded up drying of metal parts. Twelve Chromalox electric radiant heaters rated at ⅛ kw each focus far-infrared heat on parts as they leave the washing and bonderizing tunnels. With a conveyor speed of 6 fpm 3000 lb of brackets, angles, channels, clamps and similar parts are dried per hour. Insulation and reflective aluminum sheeting are used to retain heat in the oven as much as possible. The escalator type oven used here is well suited for the job being done. It demonstrates the adaptability of the all-metal radiant heaters mounted at an oblique angle that assures even absorption of heat by the passing work. Accurate heat regulation for varying part sizes is provided by variable input controllers and magnetic contactors. Controller settings can also be varied to compensate for changes in rinse temperature, ambient building temperature and humidity. *Edwin L. Wiegand Co.*

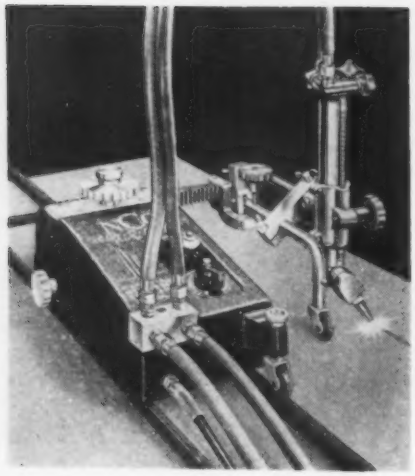
For more data circle No. 16 on postcard, p. 139.



Vacuum metallizer features compactness of layout

Compactness in the layout of the vacuum pumping equipment and a high degree of automation in the control system with interlocks to guarantee safety and dependable operation are design features of a new 72-in. vacuum metallizing unit. Rapid pumpdown of the chamber, which is 72 in. diam x 60 in. long, is accomplished by a three-stage pumping system. The three diffusion pumps are directly connected to the rear face of the metallizing chamber, without a manifold, providing a more rapid and efficient pumping cycle. The pumping system, working as a unit, can evacuate the empty chamber to a pressure of ½ micron in 7 min. At the reduced pressure the chamber is ready for flashing the filaments and depositing the metal coating. *F. J. Stokes Machine Co.*

For more data circle No. 17 on postcard, p. 139.

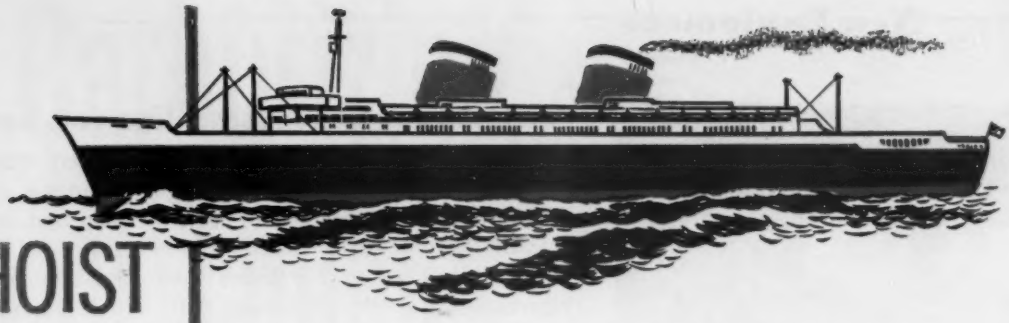


Floating torch cuts bevels on steel plate

New floating torch assembly permits uniformly accurate bevel cutting regardless of humps, bows or other unevenness in steel plate. It was developed for use with the Cut-O-Matic portable cutting machine. The unit consists of a guide wheel and new bevelling torch. The guide wheel which rests on the plate being cut, controls the distance between the torch tip and the plate. It automatically raises or lowers the torch to compensate for any unevenness in the plate. The torch is equipped with a swivel head which permits the tip to be rotated to cut whatever angle of bevel is required for subsequent welding operations. The Cut-O-Matic is a motor driven cutting machine that cuts straight lines, circles, arcs, rings strips and various irregular shapes. It can be used on steel plates, slabs and pipe. It cuts 7-in. thickness with standard 2-hose torch. *National Cylinder Gas Co.*

For more data circle No. 18 on postcard, p. 139.

Turn Page

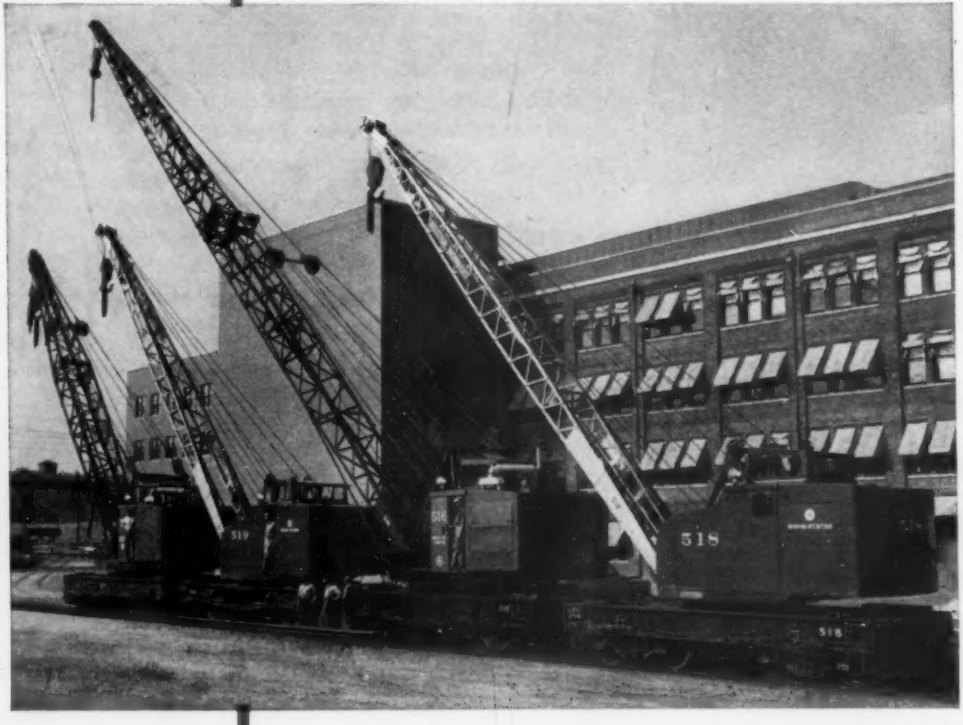


BROWNHOIST

CRANES help build the S.S. United States and other big ships for Newport News Shipbuilding and Drydock Co.

One of the largest shipbuilding and ship repair yards in the world, Newport News Shipbuilding and Drydock Co., designed and built the huge luxury liner, S. S. United States. They also build, convert and repair naval and merchant vessels of all types. For the many difficult materials handling operations this work entails, they need efficient and dependable equipment. That's why this company maintains a fleet of modern Brownhoist Diesel Electric Locomotive-Cranes.

Brownhoist Cranes perform equally well as switch engines or cranes operating with magnet, hook or bucket. Monitor Type Cab and Clear-Vision Boom give the operator full 360° visibility. Rugged construction, simplified mechanism, and easy accessibility to all moving parts help keep maintenance and repair costs low. In railroads, steel mills, mines and large manufacturing plants, Brownhoist Cranes are saving production time and money. They are built in capacities from 25 to 80 tons for virtually every materials handling operation. For complete information, consult your nearest Brownhoist representative or write us today.

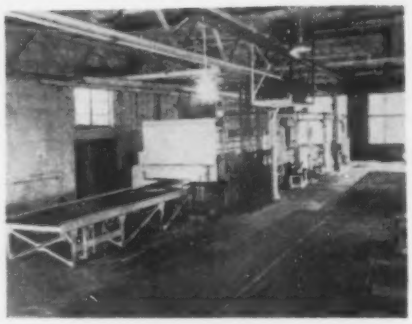


BROWNHOIST
builds better cranes

172

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

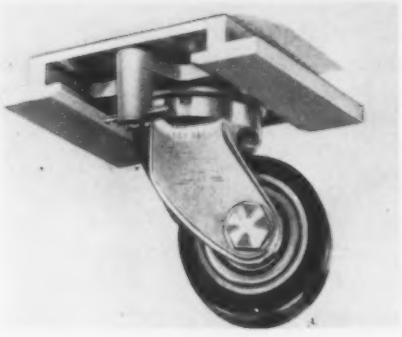
DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist, Ltd., Montreal • **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles



Continuous processing line for beryllium coils

A new automatic processing unit for beryllium coils and rods includes a special inert gas generator, electrically heated roller hearth type furnace, and automatic timed reciprocating quench. The unit will handle coils up to 36 in. diam, and bars up to maximum of 2½ in. diam x 20 ft long, at the rate of approximately 2000 lb per hr. Automatic handling and control permit preset required speeds, cycles and transfers for assured predetermined processing results. Many sizes and optional features suit specific production requirements. *Continental Industrial Engineers, Inc.*

For more data circle No. 19 on postcard, p. 139.



Demountable casters speed air cargo handling

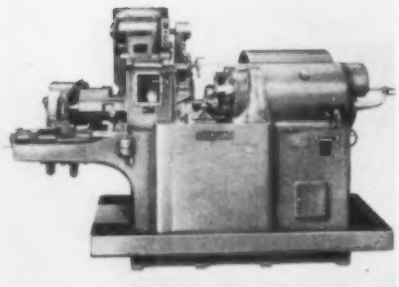
Aerol demountable casters are playing an important part in air freight service, it is reported. The caster units are locked on grooved mounting plates on handling trucks, permitting efficient, quick mobility. When spotted on the plane, casters are quickly removed, and the skid load weight is evenly distributed. At destination, another set of casters is locked in place, and the load is removed intact to the freight warehouse. Storage racks for four casters each, are included, making the entire set readily accessible when needed. *Aerol Co.*

For more data circle No. 20 on postcard, p. 139.

Vibration analyzer tests amplitude and frequency

The Model 553 vibration analyzer permits selective readings of steady state vibration phenomena from as many as six points on a device or machine under test, and while it is operating under any simulated circumstance of load or speed. It permits checks of vibration phenomena at full power. In use, six pickups are fastened at the points of stress to be analyzed and a selector switch permits selective reading from the desired pickup. Amplitude and frequency of vibration are read directly from a meter. An Oscilliscope permits visual observation of the wave trace and photographic recording of wave patterns. *International Research & Development Corp.*

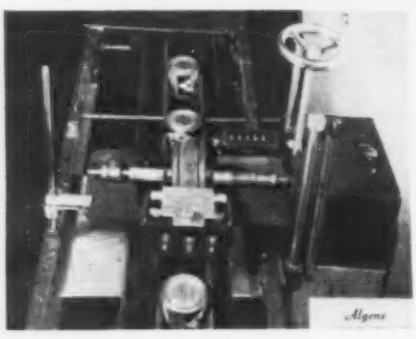
For more data circle No. 21 on postcard, p. 139.



Single spindle automatic is easy to operate

Features of the new Cleveland 2½-inch model AW single spindle automatic include Geneva turret index, universal camming, quick change collets, hand crank stock feed adjustment and many others. Its simplified mechanical design provides a machine that is easy to operate and maintain. Efficient cutting speeds for every kind of metal and for all types of cutting tools are provided by 40 spindle speeds ranging from 69 to 1920 rpm. Front and rear cross slides are wide and rigidly supported on the machine bed to insure smooth, vibration-free operation under heavy forming cuts. *Cleveland Automatic Machine Co.*

For more data circle No. 22 on postcard, p. 139.



Printing machine marks 1 to 90 objects per min

Tops of cans, boxes or other similar objects can be marked at the rate of 1 to 90 objects per minute on a new type coding and printing machine, that can be installed on any conveyor. The user can adjust heights and spots to be marked in a matter of seconds. A fractional horse-power motor brings the printing wheel to the starting position after each impression. Speed of the conveyor dictates speed of the printing. Ink fountain and distributing roller give continuous operation. *Algene Marking Equipment Co.*

For more data circle No. 23 on postcard, p. 139.

Turn Page

Which Carburizing Grade of Tubing Is Best for You?

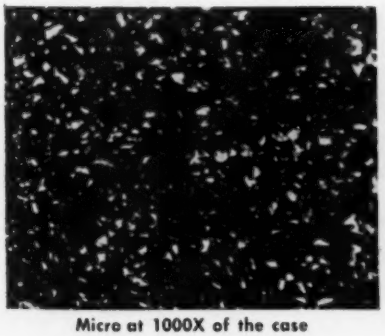
...B&W Can Supply Them All

When you want to carburize for hard surface and at the same time maintain a tough core, it is wise to examine all available carburizing grades to determine which is most suitable for your specific operation. The low-carbon alloy steels listed are typical of those designed for ease of carburization.

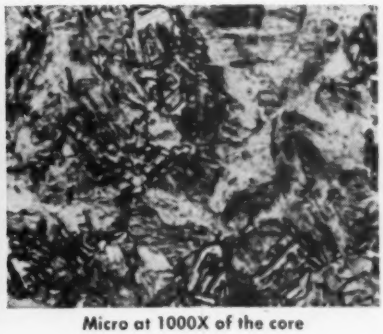
After carburizing, the steel has a high carbon content on the surface and only the carbon content of the base alloy in the core. This provides, after suitable heat treatment, a surface which is hard and wear resistant and a core that is tough and ductile—a combination desired in many applications. Alloying elements impart an ability to develop a deeper case for a given set of carburizing conditions and provide a more gradual transition in microstructure and hardness from case to core than in a plain carbon steel.

In the application of these low-carbon alloy steels it is possible, in many instances, to use alternate grades without loss of desirable mechanical properties. Discuss your requirements with Mr. Tubes—your nearby B&W Tube Representative. You'll find B&W Bulletin TDC-149 helpful, too. Write for it.

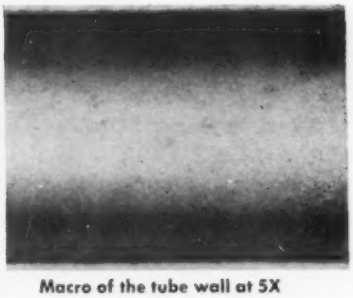
TYPICAL GRADES
1320
2317
2515
3120
E3310
4023
4320
4620
4815
5120
6120
8620
8720
E9310



Micro at 1000X of the case



Micro at 1000X of the core



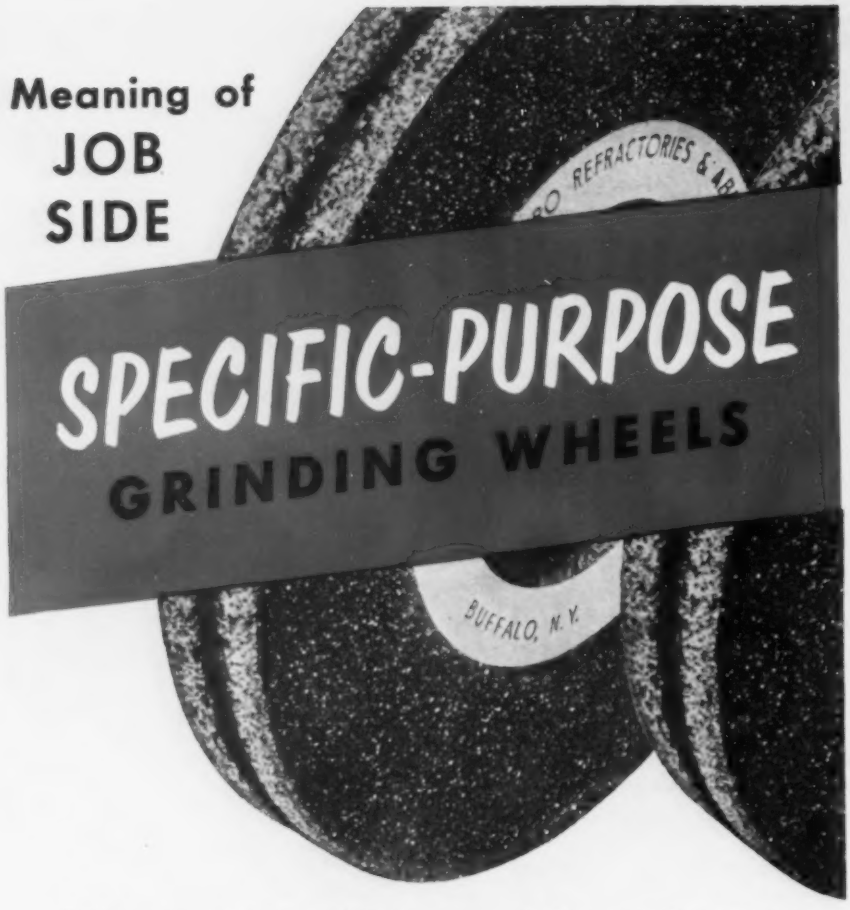
Macro of the tube wall at 5X

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W SEAMLESS and WELDED TUBES

TA-1746 (C)

Meaning of
JOB
SIDE



Let's assume you want to better your grinding operation. You let Electro's technical expert see your present situation.

He comes to your job-side without cost or obligation to you.

From his skill and experience in working with many situations, supported by a young, pleasantly aggressive, creative manufacturing organization, anxious to win on merit . . . he and the organization resolves what is seen at your job-side and what you'd like to better, into a "specific-purpose" grinding wheel, for your job.

In due time a test is run. At your job-side the Electro "specific-purpose" grinding wheel, whether resin or vitrified, thus competently specified for your job . . . will produce the better results sought.

To take advantage of this job-side service all you need to do is write, phone or wire: "Ask your representative to call on me."

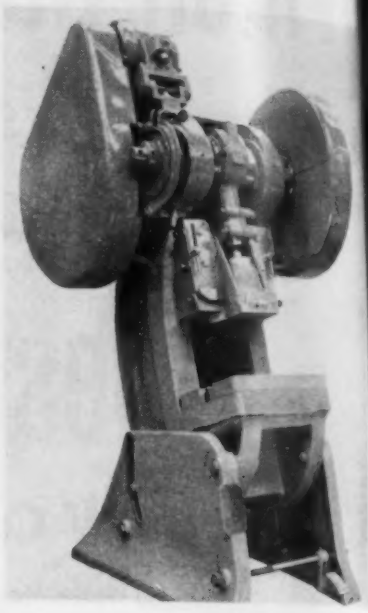
Electro Refractories & Abrasives Corporation • 344 Delaware Ave., Buffalo 2, N. Y. • *Manufacturing Plants:* Buffalo, • Electric Furnace Division, Cap-de-La-Madeleine, P. Q., Canada • Regional Warehouse: Los Angeles 58, California Grant S. Diamond, President.

Electro
TRADE-MARK
SINCE 1919

E-440

—New Equipment—

Continued



Geared press

A geared version of the largest Besco inclinable power press with adjustable stroke is powered by a 5 hp 1440 rpm motor. With the same pressure rating of 40 tons as the ungeared model, a considerable increase in work capacity per stroke is achieved, at the reduced speed of 45 strokes per min. Flywheel speed is increased to 230 rpm. Length of stroke is adjustable from ½ to 3¼ in., adjustment being made at the eccentric bush fitted to the split-sleeve type pitman. Maximum clearance between ram face and bed, with stroke down and ram adjustment up, is 11 in. *F. J. Edwards Ltd.*

For more data circle No. 24 on postcard, p. 139.

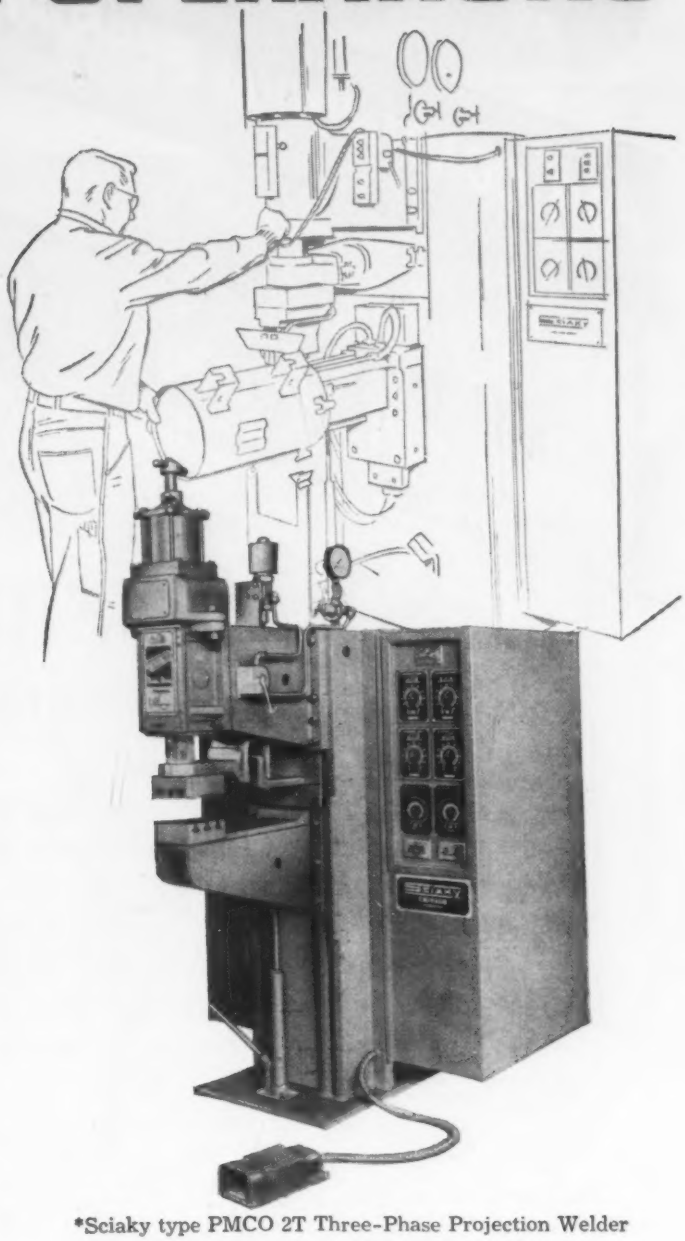
Aluminum pastes

Two new type non-leafing aluminum pastes have been developed for use in protective and decorative coatings. Although the pigments carry a grease film, it is of such a nature that the flake will not leaf or flow when it is formulated in a paint or other finish. Uniform dispersion of the pigment throughout the paint film yields the characteristic metallescent effect. Increased durability of the finish is also provided with use of these pigments. *Metals Disintegrating Co.*

For more data circle No. 25 on postcard, p. 139.

Turn Page

SEVEN DIFFERENT PRODUCTION OPERATIONS ON ONE STANDARD WELDER



*Sciaky type PMCO 2T Three-Phase Projection Welder joins seven different parts to Moloney Transformer Tanks. A two-switch foot pedal provides immediate selection of preset heat and pressure sequences for different welds without removing tank from welder or stopping production to reset controls.

Versatile Sciaky Standard Three-Phase Projection Welder Sharply Reduces Tooling Costs

With typical efficiency, Moloney Electric Company uses a minimum number of Sciaky machines for a maximum number of welding operations.

After careful study, Moloney found Sciaky electric resistance welding offered many advantages over other methods of fabrication. Sciaky patented Three-Phase principle of operation provided automatic compensation for variation in material thickness, piece-part configuration, and fit-up to improve weld quality and machine versatility.

Only Sciaky Three-Phase characteristics of balanced line load, high power factor, and 75% current reduction permitted such extensive use of resistance welding with existing power supply.

Now Moloney pressure-tight transformer tanks, from 10" to 30" in diameter, and 21" to 54" in height, are fabricated almost completely on Sciaky Three-Phase welders.

For complete details on the efficiency and economy of Sciaky resistance welding at Moloney, write for "Resistance Welding at Work", Volume 3, No. 7.

Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

4915 WEST 67th STREET, CHICAGO 38, ILLINOIS

Plants: Chicago • London • Paris Sales Offices: Chicago, Ill. • Buffalo, N. Y. • Cleveland, Ohio • Dayton, Ohio • Detroit, Mich. • Ft. Worth, Texas • Hollywood, Calif. New York, N.Y. • Philadelphia, Pa. • Washington, D.C.

SPECIFY

FOLLANSBEE

COLD ROLLED STRIP

You get continuous, trouble-free performance in your production line when you feed your presses directly from coils of Follansbee Cold Rolled Strip.

This high-quality, custom-made strip steel, furnished in a wide range of tempers and finishes, is sure to offer real advantages in any automatic press requirement. There's real productioneering efficiency and time-saving economy in store for you when you use Follansbee Cold Rolled Strip Steel for your forming and stamping operations.

Follansbee can supply you with quick, direct warehouse-type service from the mills. You can depend on your trained Follansbee Steel Representative. Consult him today. He will be glad to discuss your fabricating problems with you.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

Cold Rolled Strip — Seamless Terne Roll Roofing

Polished Blue Sheets and Coils

Sales Offices—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada. Mills—Follansbee, W.Va.

FOLLANSBEE METAL WAREHOUSES

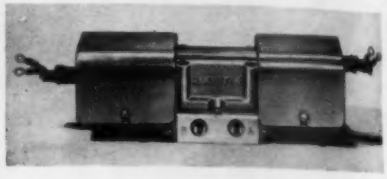
Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.

—New Equipment—

Continued

Four-way valves

Two new ¼-in. 4-way poppet-type valves in the Hannifin P-M line are direct solenoid operated, extremely compact and simple, and very fast. They are recommended for speeds as high as 600 cycles per min. Principal use will be for the electric control of small, double-acting

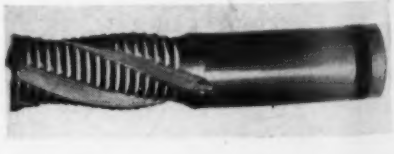


air cylinders on short stroke, high speed applications. Model CC1-25 is the single-solenoid model, and the single valve stem, which is the only moving part, is spring returned. Model CC11-25 has two solenoids, and its single valve stem remains at either end of its short stroke until the other solenoid is momentarily energized to return it. This makes momentary contact operation possible. Valve body and the solenoid can be removed for servicing by removing four cap screws, without disturbing line connections. *Hannifin Corp.*

For more data circle No. 26 on postcard, p. 139.

Chip breaking cutter

This new milling cutter is designed to hog metal at higher speeds with heavier cuts. Spiral serrations break metal chips into small particles, eliminating excessive friction and heat. Cutters are made



of highest quality Swedish electric steel. In mild steel, tool life has been reported as high as 60 hr between sharpenings. Although designed to increase rough cutting speeds, it does produce a fairly finished cut. Sizes range from 7/16 to 2 in. *Precision Industrial Tools.*

For more data circle No. 27 on postcard, p. 139.

Turn Page

When the Going's Rough!

Designed and Built for Steel Industry Application

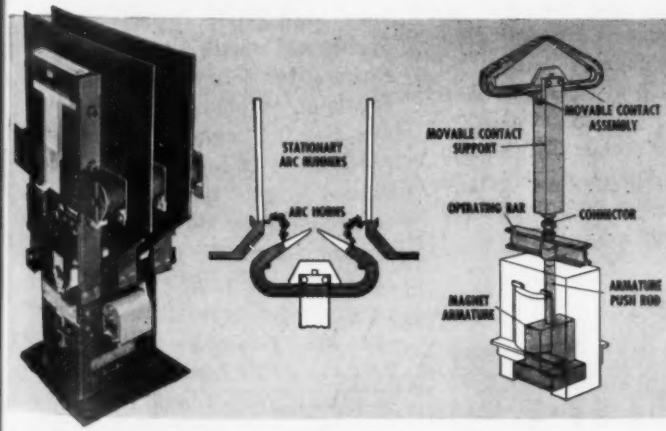
ALLIS-CHALMERS
Type H Starters
FOR 2300 TO 5000 VOLT MOTORS

HERE IS A STARTER that is as rugged as the steel industry itself. All the starter's components . . . contactors, meters, overload relays, current limiting fuses, auxiliary switches . . . are engineered and coordinated to meet heavy duty steel mill demands — to provide high capacity interruption and complete protection for man, motor and machine.

Exemplifying the ruggedness of the Type H starter is the 256 air-break contactor. Frequent starting, inching, reversing or dynamic braking are taken in stride by this dependable performer. Contactor operations can be numbered in the millions with only routine servicing.

In many steel mill applications demanding high repetitive duty, the Type H starter can be used in place of circuit breakers . . . affording substantial savings in initial cost *and* upkeep. Find out how the Type H starter fits into your control picture. Call your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wis. Ask for bulletins 14B6410B and 14B7303.

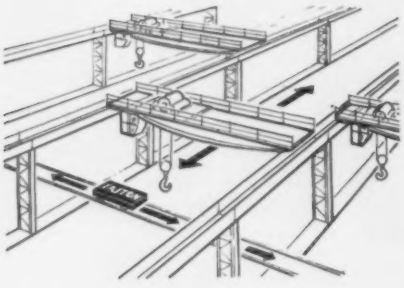
A-4102



Type 256 Air-Break Contactor

Double-break contacts, vertical action and dual blowouts provide long, trouble-free life. No turning shafts, shaft bearings or flexible leads to cause maintenance headaches.

ALLIS-CHALMERS



Cross-bay transfer cars supplement crane service

Lateral handling of materials is provided by motorized cross-bay transfer cars, to supplement overhead crane service in modern multiple bay plants. The car is motorized by a standard Link-Belt Electro-Fluid drive. Movement of the car is pushbutton controlled either from a remote station or by deadman action on the car. A limit switch stops the car automatically at its destination. Basically a platform car, the transfer unit may be equipped with special superstructure adapting it to special purposes. *Easton Car & Construction Co.*

For more data circle No. 28 on postcard, p. 139.

DESIGNING a NEW PRODUCT ?

Here's how to reduce WEIGHT AND COST without REDUCING STRENGTH

use BUFFALO STEEL High-Strength

Also Producers of Hi-Bond Reinforcing Bars and "Quick-Set" Steel Fence Posts and Sign Posts

✓ ANGLES ✓ CHANNELS
✓ FLATS ✓ ROUNDS
✓ TEES ✓ SQUARES
✓ SPECIAL SHAPES

● By using *higher strength* Buffalo Rail Steel, smaller, lighter weight steel parts and sections can be designed into products without reducing quality or strength. A ton of Buffalo Rail Steel goes further by making more production units.

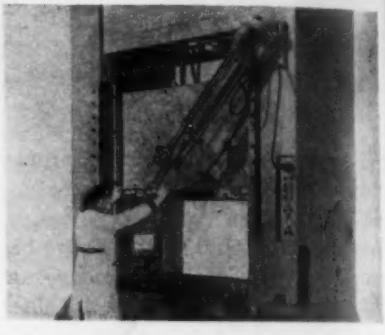
This is only the first cost saving advantage. Cost reductions continue to "snow ball" in receiving, handling, stocking, processing and shipping both raw material and finished products.

Under today's high cost manufacturing, shipping and marketing conditions, these important cost factors cannot be overlooked, so investigate Buffalo Rail Steel TODAY. There should be a place in your design picture to cut weight and cost with this higher strength steel, — minimum tensile strength 80,000 pounds and elastic limit 60,000 pounds.

BUFFALO STEEL DIVISION
H. K. PORTER COMPANY, INC.
OF PITTSBURGH
TONAWANDA, NEW YORK

Press control unit

New, completely flexible method for positioning the run and stop buttons of a press—a pushbutton control bar suspended by a universally adjustable telescoping arm—



has been developed. With each change of dies or operating procedure, this control bar can be relocated to conserve motion and time, thus increasing the operator's efficiency, comfort and safety. *Danly Machine Specialties, Inc.*

For more data circle No. 29 on postcard, p. 139.

Precision lathe

Accuracy, perfect concentricity and very high finish in the mass production of small, slender parts are claimed for a new Swiss type high precision automatic lathe, the Howard D-500. Capacity is ½ in. and parts up to 12 in. long, having total turned lengths not over 4 in., may be produced by using a stop attachment. Attachments for drilling, chamfering, counterboring, tapping, threading, slotting and tapering are available. The machine maintains the best features of the Wickman No. 2 and attachments and many of the parts are interchangeable on both machines. *Detroit Cam & Tool Co.*

For more data circle No. 30 on postcard, p. 139.

Turn Page

ONE OF A SERIES OF ADVERTISEMENTS ON THE HISTORY OF ELECTROPLATING

a gamble that gave birth to the rectoplater

—workhorse of the plating industry!

One hot summer evening, back in 1937, L. K. Lindahl and John Bogel, his neighbor and associate, were in Lindahl's living room, still debating after three months of "rocking chair conferences," the desperate need for a rectifier made in the U.S.A.—a standardized production unit that would meet the electroplater's requirements.

Suddenly, Lindahl said, "John, I'm tired of waiting on those expensive, unreliable imported rectifiers. Let's gamble and build our own rectifier for Udylite customers." "Let's do it," John agreed.

And so the Udylite Rectoplater was born. Udylite went to Mallory, who had been making copper sulphide units for use in radios and battery chargers. Lindahl and Bogel, together with Mallory engineers, soon designed a 1500 amperes rectifier. They backed up their judgment with an order to Mallory for 100 of these units that have since made history because:

1. The Udylite Rectoplater outperformed any other method of converting current and sold for half the price.
2. Engineered for the plating shop—the Udylite Rectoplater performed perfectly under the most adverse conditions.
3. The standardized Rectoplater was a stock item—ready for immediate delivery to Udylite customers.

It was this same Udylite Rectoplater that broke the bottlenecks of plating production in the dramatic days of World War II—established it as the Workhorse of the Plating Industry. Udylite was able to furnish these desperately needed direct current rectification units on a "same day" delivery basis!

Over the years Udylite improved the original Rectoplater. Continuous research and experimentation led to the perfection of the newest, most modern Udylite selenium Rectifier . . . a basic improvement on the well-known Rectoplater. The Udylite program of research never stops, and the rectification units of tomorrow which mean more production, more profit to you, are already in pilot stages at our modern Udylite research laboratory.

This is just another one of the many contributions made by Udylite to the art of modern electroplating.

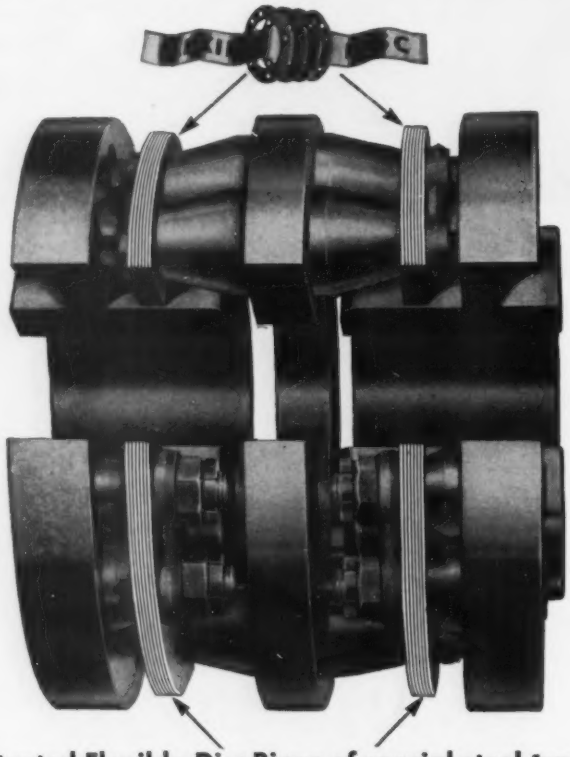
PIONEER OF A BETTER WAY IN PLATING...

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

AVOID COSTLY SHUT-DOWNS!

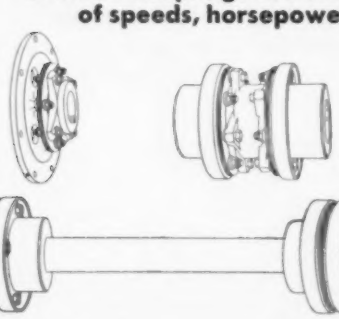
Specify THOMAS Flexible Couplings for Power Transmission

DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes.



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF FLEXIBLE COUPLINGS ONLY FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

Bench comparator

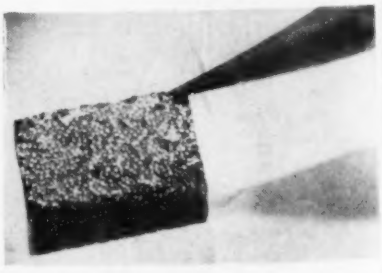
Gaging inside or outside diameters on short or production runs can be quickly and accurately done with this new K7-R bench comparator. Illustrated is the T-plate type with adjustable ID and OD jaws; several other types of jaw arrangements with jaws made to

specific requirements are available. This stable gage has a heavy surface ground top plate and is equipped with a fine setting adjustment for quick, easy and accurate setting up. *Acra-Ment, Gage Div. of Myer Corp.*

For more data circle No. 31 on postcard, p. 139.

Bearing material

Self-lubricating metal with exceptional bearing strength has been developed through a special process that employs both ferrous and nonferrous metals and specially formulated lubricative pigments locked together to create a self-lubricated



metal. Ratio of lubricative pigment to metal can be rigidly controlled with lubricity engineered to meet the requirements of specific bearing pressures. The material may be used dry or in conjunction with oil. *Booker-Cooper, Inc.*

For more data circle No. 32 on postcard, p. 139.

The Iron Age

SALUTES

Bent L. Weaver

He has applied a lifetime of industrial experience to improving techniques for making wire cloth.

AT an age when most Americans are devoting their energies to fishing and puttering around the backyard, Bent Weaver is "only just getting started" in his determined development of the science—or art—of weaving metal cloth.

At a springy 74 years of age, Bent guides the destinies of the world's largest producer of insect screen cloth—The Mount Wolf, Pa., plant of Colorado Fuel and Iron Corp. His formula for successful plant management: Constant research and development.

"There is no 'perfect' way of doing anything," he says. "You can always improve on every manufacturing method." To prove his point, over the years he's devised a constant stream of better ways to weave metal cloth. His nonstop improvement program—over $1 million since 1944—has practically rebuilt the original plant, created an industry showplace.

Bent began his business career in 1893 as an office boy with Pennsylvania Steel Co., now part of Bethlehem Steel. In 1904 he was spending his spare time studying the then-new science of industrial engineering.

After a stretch as superintendent of all Bethlehem foundries, Bent hung out his shingle as an industrial engineering consultant. Firms which drew on his talents read like a Blue Book of East Coast industry.

But it was in 1944, when he took over CF&I's Mount Wolf plant, that he really found his metier. It's safe to say that wire cloth making is now the dominant interest in Bent's life.

Wickwire oil tempered wire . . .

STEEL RIBS FOR HEAVY UMBRELLAS, TOO

Not all oil tempered wire is used for springs. A typical example of its diversified applications is the familiar beach umbrella, also used on lawns and terraces, and in modified form on tractors, bulldozers and similar equipment.

For the steel ribs of these heavy umbrellas many manufacturers find Wickwire oil tempered wire ideal. This wire is stiff so as to retain its shape; uniform so that all wires bend the same; flexible so that the wires follow the contour of the umbrella; and ductile so that they may be easily swaged.

Wickwire oil tempered wire is available in a size range from .007″ to .5625″. Round wire can be supplied in coils or cut lengths. Wickwire also manufactures flat tempered wire.

High or low carbon steel . . . in all tempers, grades and finishes—For the Wire You Require; Check First With Wickwire.

THE COLORADO FUEL AND IRON CORPORATION • Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

WICKWIRE WIRE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

1944

The Iron Age INTRODUCES

William O. Robertson, elected a vice-president, ARMCO DRAINAGE & METAL PRODUCTS, INC.

J. Edgar Glass, promoted to president and general manager, THE COLSON CORP., Elyria, Ohio.

Frank B. Wolcott, elected vice-president in charge of manufacturing, WYANDOTTE CHEMICALS CORP., Wyandotte, Mich.

Robert F. Windfohr, elected a director, CONSOLIDATED VULTEE AIRCRAFT CORP., San Diego, Calif.

B. T. Rabuse, appointed to newly-created post of director of purchases, GOULD-NATIONAL BATTERIES, INC., St. Paul; and **Willard C. Shull,** named purchasing agent.

William Bader, appointed vice-president, New Experimental Research and Product Development Div., WESSON CO., Ferndale, Mich.

Gilbert E. Jones, promoted to executive assistant, INTERNATIONAL BUSINESS MACHINES CORP., New York.

Ashworth N. Stull, elected to board of directors, LINATEX CORP. OF AMERICA, Rockville, Conn.

Gordon W. Johnson, becomes associated project director on casting design-process manual, ALLOY ENGINEERING & CASTING CO., Champaign, Ill.

John G. Kruse and **Richard L. Post,** named assistant secretaries, MINNESOTA MINING & MFG. CO., St. Paul, Minn.

Russell A. Smith, appointed director of purchases, BARON STEEL CO., Toledo.

Thomas A. Norton, Jr., appointed supervisor of Standards, HOUDAILLE-HERSHEY CORP., North Chicago Div.

William J. Hanley, promoted to the controllership, new automatic transmission dept., Marvel-Schebler Products Div., Decatur, Ill., BORG-WARNER CORP., Chicago.

Charles R. Bell, appointed full research engineer, small arms section, Mechanism and Dynamics Dept., Armour Research Foundation of ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago.

Peyton L. Morgan, Jr., appointed southern district engineer, Air Appliance Div., U. S. HOFFMAN MACHINERY CORP., New York.

John W. Govier, promoted to chief draftsman, Allenport, Pa., Works, PITTSBURGH STEEL CO., Pittsburgh; and **William E. Brown,** promoted to plant engineer, Allenport Works.

George M. Hoffman, appointed project engineer, TRION, INC., McKees Rocks, Pa.

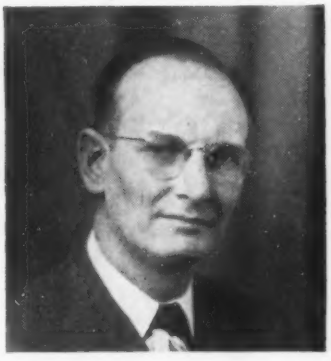
O. W. Mendenhall, appointed service engineer, Milwaukee, ACHESON COLLOIDS CO., Div. of Acheson Industries, Inc., Port Huron, Mich.

Frank Grilli, joined branch sales office, New York, DIAMOND ALKALI CO., Cleveland.

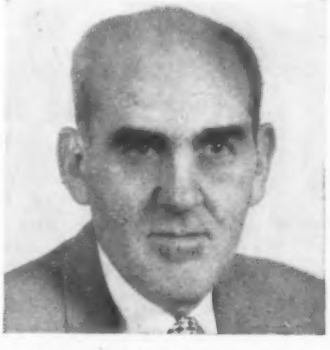
W. C. Davis, appointed to the sales staff, AMERICAN HOIST & DERRICK CO., St. Paul.

George E. Fouch, named manager, new Jet Engine Dept., GENERAL ELECTRIC CO.; **David Cochran,** named manager, new Aircraft Gas Turbine Development Dept.; **Bertram W. Mahoney;** becomes manager new Evendale Operating Dept.; and **Jack S. Parker,** named manager of new Small Aircraft Engine Dept.; and acting general manager Aircraft Accessory Turbine Dept.

LORIN L. FERRALL, appointed assistant vice-president, Crucible Steel Co. of America, Pittsburgh.



J. E. POOLE, appointed manager of manufacturing and engineering, The Liquid Carbonic Corp.



JOHN J. BOYLAN, named assistant general manager, Newport Steel Corp.

William E. Riddiford, appointed to assistant credit manager, Central District, American Steel & Wire Div., U. S. STEEL CORP., Cleveland.

Laurence Young, appointed chief electrician, KAISER STEEL CORP., Fontana, Calif.

Francis J. Coates, appointed sales manager, MISCO PRECISION CASTING CO., Detroit; **William J. Flessner,,** now in charge of Industrial Engineering Dept.; **William I. Dieters,** becomes staff engineer; and **Daniel O. Ryan,** appointed personnel director.

James A. Babcock, named plant manager, watthour meter plant, Raleigh, N. C., WESTINGHOUSE ELECTRIC CORP.

William A. Ross, appointed sales manager, CIRCO EQUIPMENT CO., Rahway, N. J.

Peter S. Blake, appointed works manager, A. O. SMITH CORP., new automotive frame plant under construction at Granite City, Ill.

J. J. Billman, becomes western sales manager, CLAYTON MFG. CO., El Monte, Calif.; and **H. M. Kirkby,** named to take over the sales director, Eastern division.

Carmine J. Venuto, becomes mineralogist, Research & Development Dept., FOOTE MINERAL CO., Philadelphia.

Harold Van Pelt, named district manager, MILLER ELECTRIC MFG. CO., Appleton, Wis.

Edwin T. Teal, appointed regional sales manager, West South Central and Mountain states, WHITNEY CHAIN CO., Hartford, Conn.

Dr. P. W. Bakarian, named plant manager, CRAMET, INC., wholly owned subsidiary of Crane Co., Chicago.

J. A. Heidish, promoted to assistant manager of production, Wire & Cable Div., COPPERWELD STEEL CO., Glassport, Pa.

CHARLES R. TYSON, elected a member of the board, The Colorado Fuel & Iron Corp., New York.

CHARLES R. KHOURY, appointed assistant vice-president—Dept. of Ships, Isthmian Steamship Co.

DAVID I. DILWORTH, JR., appointed director of metallurgy, Crucible Steel Co. of America.

A. R. SCHNELLER, appointed manager—welding sales, Pacific Coast Region, Welding Products Div., A. O. Smith Corp.

SEND FOR 248-PAGE
WILMOT CHAIN & CONVEYOR Catalog
W
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As Originators of Rivetless Chain, Wilmot Offers Widest Choice of Chain Sizes and Conveyor Attachments
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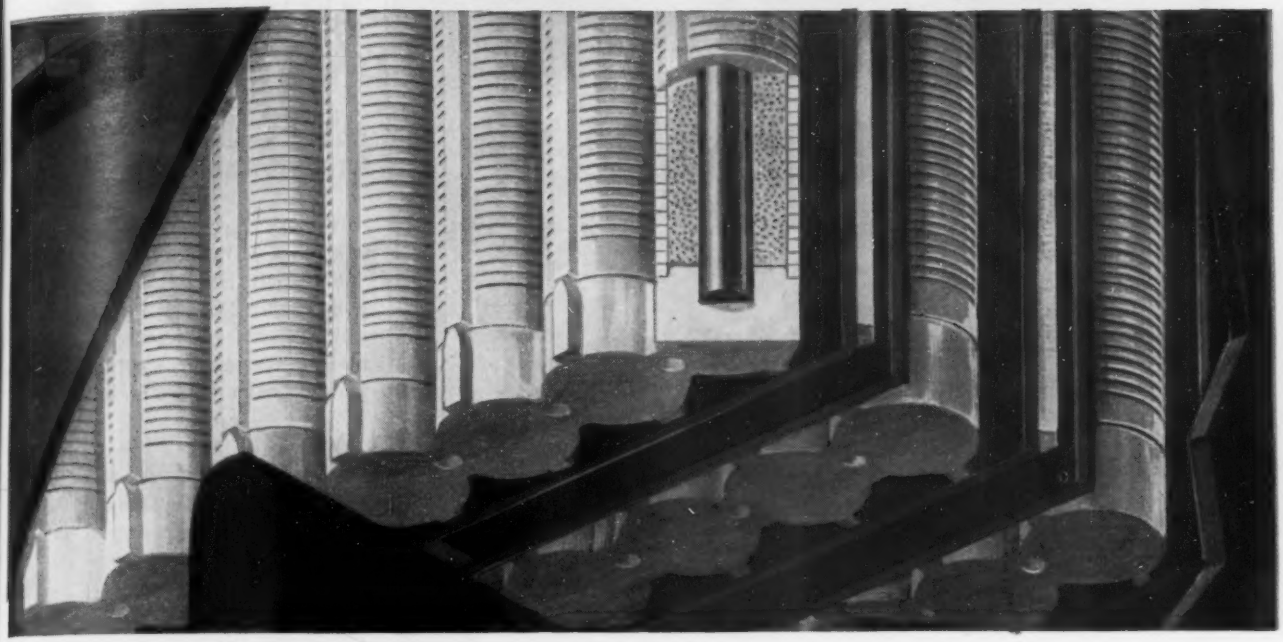

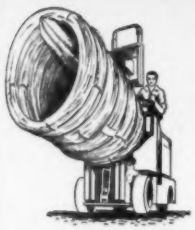

This cutaway picture shows the inside of the new T H EXIDE-IRONCLAD Battery.

Its larger positive plates, containing corrosion-resistant Silvium, are different . . . unique . . . exclusive! No other type of positive plate construction offers you the advantages of the T H Exide-Ironclad, with its slotted plastic tubes, permanently sealed on the bottom with polyethylene tube sealer. More active material is exposed to the electrolyte, resulting in greater power. More active material is retained, providing higher battery capacity for a longer working life. Other features include improved negative plates . . . practically indestructible Pormax separators . . . new sealing compound . . . shockproof molded jar . . . unbreakable quarter-turn vent plugs of plastic . . . corrosion-resistant tray coating.

All of the features of the new T H Exide-Ironclad Battery construction provide direct operating-hour savings for you.

Now-more than ever before...
YOUR BEST POWER BUY AT ANY PRICE!

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The new T H Exide-Ironclad BATTERY

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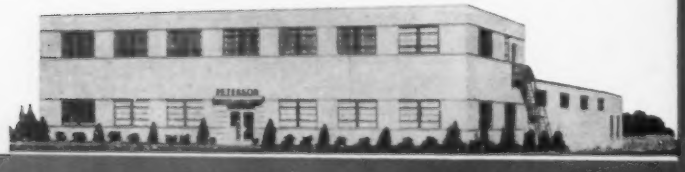
Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. I.



PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

—Personnel—

Continued

Stuart D. Nelson, appointed export sales manager, AUTOMATIC TRANSPORTATION CO., Chicago.

Leland Sharron, appointed assistant to the plant superintendent, Fabricating Div., THE PLUME & ATWOOD MFG. CO., Waterbury, Conn

Samuel H. Greenwood, appointed district manager, Philadelphia, F. J. STOKES MACHINE CO.

Floyd Hartshorn, named district manager, Milwaukee office, THE TIMKEN ROLLER BEARING CO., Canton, Ohio; **Donald Van Orman,** appointed district manager of Minneapolis. **George W. Curtis,** Milwaukee division sales manager, has retired.

Anderson W. Pollard, appointed sales representative, WORCESTER PRESSED STEEL CO., for the Buffalo and Pittsburgh areas.

Stephen Parey, appointed assistant purchasing agent, Cleveland and Pittsburgh District, American Steel & Wire Div., U. S. STEEL CORP., Cleveland.

Harold Weinberger, appointed advertising manager, READING TUBE CORP.

O. E. Sammelson, appointed purchasing agent, Gage Div., THE ELECTRIC AUTO-LITE CO., La Crosse, Wis.

William G. Arnold, appointed manager of manufacturing, Conduit Products Dept., GENERAL ELECTRIC CO., Bridgeport, Conn.

Russell E. Reynolds, named sales engineer, UDYLITE CORP., Detroit.

Thomas B. Newton, appointed manager, Marketing Service Dept., Market Development Div., LUKENS STEEL CO., Coatesville, Pa.

Dr. Arthur G. Metcalfe, named full research metallurgist, Metals Research Department, Armour Research Foundation of ILLINOIS INSTITUTE OF TECHNOLOGY, Chicago.

OBITUARIES

James V. Scaife, Jr., 50, former president of the Scaife Co., after a long illness.

Aluminum shapes faster—

the Iron Age
FOUNDED 1855
Technical Articles

Fabricators Install EXTRUSION PRESSES for Quick Service

By W. G. Patton
Asst. Technical Editor

◆ Aluminum door and window manufacturers gain multiple benefits by installing extrusion presses . . . Produce variety of shapes to meet growing need for quick service, lower material costs, better quality control.

◆ A 1250-ton Watson-Stillman press will make six extrusions simultaneously . . . Dies can be switched in 5 min . . . Extrusion cycle averages 60 sec.

◆ RAPIDLY GROWING demand for aluminum doors and windows plus the obvious advantages of a quickly responsive local source of extrusions have resulted in the installation of several aluminum extrusion presses in the Detroit area within the past few months.

Most recent installation is a 1250-ton Watson-Stillman extrusion press by a producer of aluminum doors and screens. The decision to install their own extrusion press gives these producers the following advantages:

1. Establishes a quickly responsive source of materials.
2. Reduction of inventory.
3. Simplification of production scheduling.
4. Provides emergency service for customers if required. Dies can be changed in 5 min.
5. Reduced cost of materials.
6. Quality control.

To understand fully why a local manufacturer of aluminum windows and doors can justify the investment in a 1250-ton extrusion press it is necessary to know that the requirements of some local producers of aluminum doors and windows exceed a million lb of Al per year.

Extrusions used by aluminum window and door manufacturers vary in cross section from light screens to comparatively large sections used at the bottom of an all-aluminum door. A large stock of dies is required to meet these varied production requirements.

Some producers say they expect eventually to produce at least 50 different extruded shapes on a W-S press. At the present time, one firm makes six extrusions simultaneously. Later, it may be possible to make eight extrusions during a single stroke of the press, officials say.

First step in the production of aluminum extrusions is sawing billets to length. This is usually accomplished in a horizontal band saw, such as a Wells No. 12 horizontal band saw.

Length is closely held in this type saw which also permits minimum interference with operations resulting from chip accumulations.

After the cut-off, billets may be moved by roller conveyor to the billet heating furnace. Billets are usually carried through a gas-fired

Heated billets are gravity fed from furnace to loader and set in position automatically . . .

MANY SHAPES and sizes are extruded on this Watson-Stillman press to meet requirements of the user. Here, a batch of extruded aluminum shapes is being loaded into a furnace for a 4-hr age-hardening treatment at 650° F.

BILLETS are cut to length in a horizontal band saw. Lengths are closely held to limits.

furnace on a stop-and-go endless chain conveyor in an end-to-end position.

A Detroit producer holds aluminum billets in the furnace at 750°F for approximately 22 min. Prior to removing the billet from the heating furnace, the temperature is carefully checked by an air-actuated pyrometer.

After reaching the proper temperature, the billet is removed automatically from the furnace and released against a stop, ready for gravity feed to the press. Release of the stop permits the heated billet to roll onto the automatic loader, just ahead of the dummy block. The heated billet and the dummy block are then elevated automatically into position.

At this point, the ram moves forward, pushing the billet through the heated extrusion chamber or container. Heat is maintained constantly in the chamber to prevent any loss of temperature during the extrusion operation. During extrusion, the dummy transmits pressure from the ram to the billet.

It takes 60 seconds

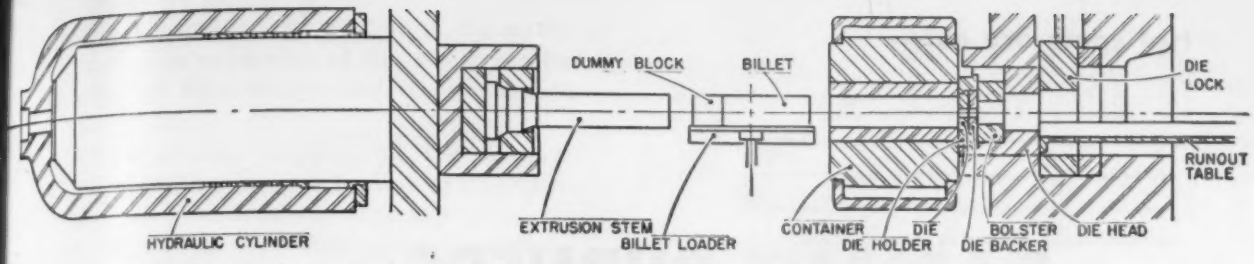
Hydraulic pressure for the ram is supplied by an oil gear pump of 3000 psi capacity.

The aluminum billet is forced through the opening or openings in the die. This operation is controlled from the pulpit by the operator, who may choose between a completely automatic cycle or full or partial manual operation. Cycling time for a typical extrusion is 60 sec.

Diameter of the dies used may range up to 8½ in. Billet size is 5 in.

At the conclusion of the extrusion stroke, the discard or butt, and the dummy block are

AUTOMATIC handling unloads billets from heating furnace and feeds them to the press.



SCHEMATIC diagram shows production flow principle used in aluminum extrusion press.

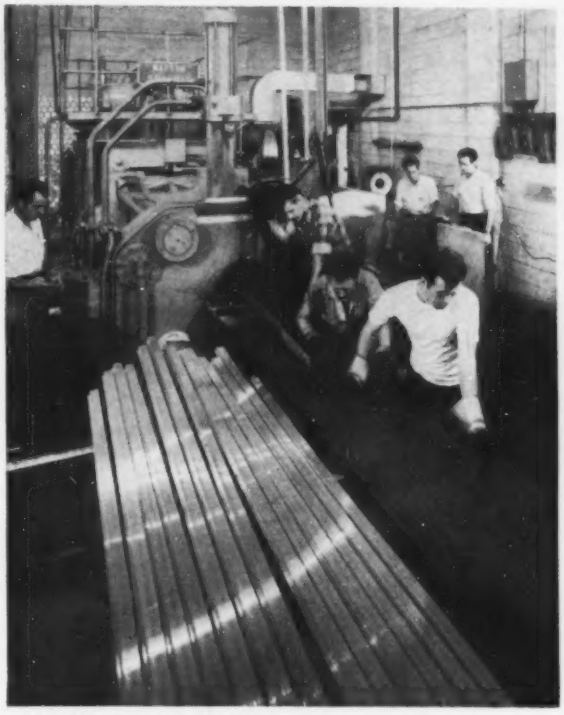
ejected from the container and sheared from the die face. Undesirable oxides and other foreign materials are thus removed from the finished product with a minimum stock loss.

As extruded lengths emerge onto the runout table, the container is moved away from the die slide to permit the butt shear to operate, the die carrier remaining stationary.

Extrusions are transferred to cooling racks prior to the stretch-straightening operation. In straightening, the material is securely air-clamped at both ends. One clamp remains in a fixed position. The second clamp is permitted to move as much as 40 in. The fixed clamp is adjustable to accommodate various size billets and extrusions.

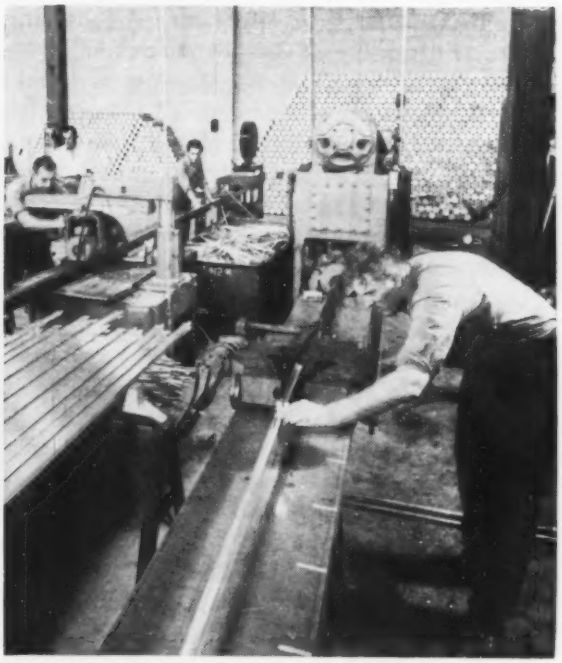
Following straightening, extrusions are cut accurately to length and heat treated at 650°F for 4 hr in an age hardening furnace.

Watson-Stillman press equipment is massive in design, permitting heavy load concentrations. Hydraulic pressure is built up by an oil gear pump driven by a 200 hp electric motor. A 10 hp Vickers pump supplies power for the auxiliaries including the billet loader, cutoff device and other equipment.



EXTRUDED LENGTHS come out of the press to runout table for transfer to cooling racks.

EXTRUSION CYCLES may be fully automatic or manual and are controlled from this pulpit.



FROM COOLING RACKS at left the extrusions move to stretch-straightening benches.

Hot spots are out—

RADIANT BURNERS Improve Galvanizing Quality, Cut Costs

By R. M. Breckenridge
Sales Engineer
and

K. E. Rasmussen
Sales Engineer
Selas Corporation of America
Philadelphia

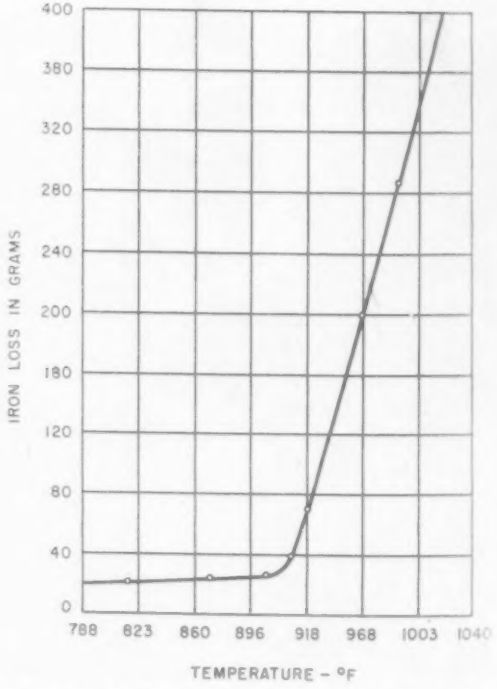
◆ You can lengthen life of galvanizing pots and cut operating costs with this improved burner . . . Novel burner design permits complete combustion of the air-gas mixture within the burner cup . . . Result: More uniform heating.

◆ There's no flame impingement on the galvanizing pot . . . Linked with proper location of burners, this cuts down pot distortion resulting from uneven expansion . . . Burner temperature is held within 5°F by close control of fuel input.

◆ MAJOR DESIGN REQUIREMENT of any galvanizing setting is uniformity of heating to prevent burning of the pot, distortion, overheating of the zinc and excessive dross formation. Development of an improved burner with several unusual design features has given operators of galvanizing settings greater control and more uniform heating within the critically narrow temperature range essential to their operations.

Uniform transfer of heat to a kettle surface to eliminate hot spots becomes important when it is realized that iron loss from the steel pot to the molten zinc is approximately 30 g at 870°F. At 920°F the loss is 60 g. At 970°F iron loss is 210 g, seven times the loss for only 100°F rise of pot temperature. The critical point on the iron-loss-to-zinc curve shows a rapid change in the rate of reaction. What would be considered a reasonable temperature tolerance in any other type of heating does not apply to galvanizing.

Uneven heating results in uneven metal expansion. In the case of a galvanizing kettle, this causes distortion of the kettle, cracks in



IRON LOSS TO ZINC jumps as critical pot temperature is reached. Close heat control is vital.

welds, and eventually destruction of the kettle. Often, uneven expansion of the kettle results in increased maintenance and severe damage to the setting.

Uniform heating is essential for uniform bath temperature. Uneven heating of zinc within the bath causes inconsistent and poor galvanizing. Often, variations in coating thickness are a direct result of fluctuations in bath temperature. Overheating of the kettle speeds up formation of dross resulting in poor galvanizing and costly waste of zinc.

Face becomes incandescent

The Duradiant burner developed by Selas Corp. of America, Philadelphia, has a unique design. The burner centers around a mixture tube of metal or ceramic, depending on the operating temperature. A high temperature tip, accurately molded of ceramic, is screwed into the end of the mixture tube. The tip, with numerous slots molded in the periphery, acts as a distributor for the gas-air mixture. Surrounding the tube and tip is a refractory cup-shaped block through which the tube protrudes.

Gas-air mixture enters the mixture tube and passes through the tip and is ignited. The burning fuel is distributed radially, to wipe the face of the cup. The cup has been contoured to cause the hot combustion products to wipe the face, regardless of the operating rate.

As the cup is heated by the combustion products at their highest temperature, the face of the cup becomes incandescent with maximum incandescence resulting from a complete gas-air mixture. With such a mixture, combustion is complete within the cup.

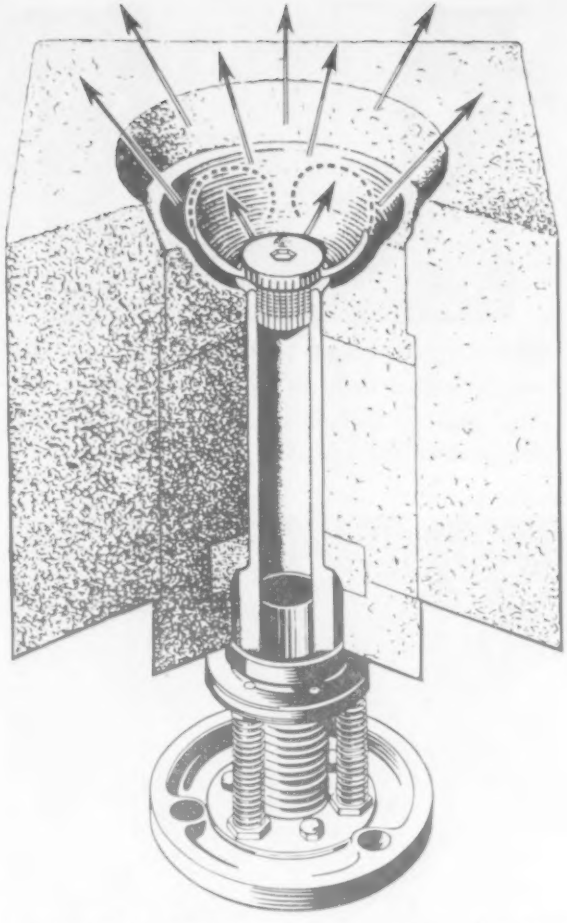
With the proper positioning, the multiple burners radiate heat evenly on the pot surface with all the required heat input being uniform and direct. The burner, with its inherent characteristic of uniform heat distribution, approaches the optimum of heat transfer, particularly when used in multiple quantities. Design of the burner permits operation with either a pre-mixed system or proportional mixers.

Overheating prevented

Introduction of many heat sources without flame impingement eliminates burning and pot distortion. The ability to distribute heat evenly over the kettle face eliminates overheating of the zinc and excessive dross formation.

Second major requirement of galvanizing installation is rapid response of the combustion chamber to control. Rapid response prevents overheating of the kettle and the zinc bath. Heat-input response to control is the best method of compensating for varying work loads.

Each burner in the walls of a setting becomes a separate heat source whose temperature depends on fuel input. Control of fuel input maintains close chamber control. The degree of incandescence in the burner cup depends on the volume of fuel released within this cup. Consider that a conventional setting responds to control only as quickly as the entire furnace wall can lose or gain temperature. Compared to this, a Duradiant setting responds in the few seconds required for the burner cup cavities to lose or gain temperature.

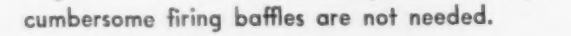


UNUSUAL DESIGN of burner causes burning fuel to be distributed radially to wipe cup face.

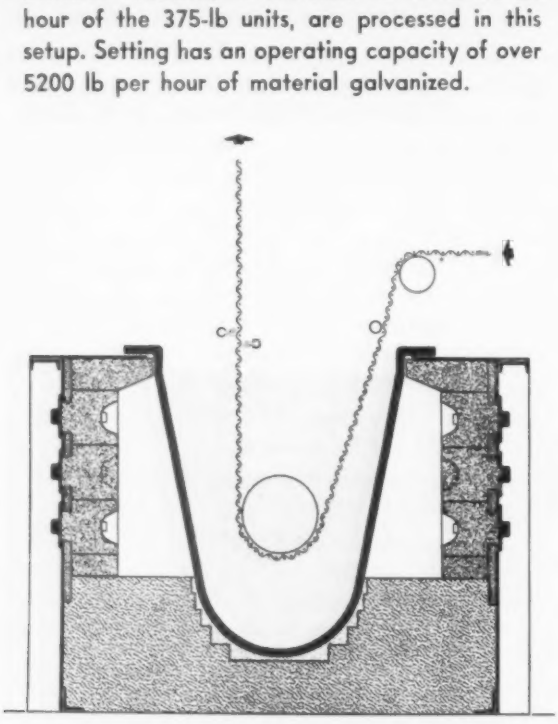
Instrumentation employing a proportioning type unit, controlling from the bath temperature, usually with a high-low instrument to protect the furnace chamber, most often provides optimum control.

The third major consideration is that heat be uniformly applied only to areas where it is required. A continuous operation uses more heat at the point where the cold work enters than where the finished material leaves the pot. Since heat losses from the pot rim and the molten metal surface make up the majority of all losses, it is more desirable to concentrate burners at the top to offset these losses. Use of many burners, each individually adjustable for fuel consumption, permits uniform

BURNERS ARE NEAR TOP in this application of the Duradiant units to typical galvanizing setting. Because combustion is complete within cup, cumbersome firing baffles are not needed.



BURIAL VAULTS, at the rate of 13 to 14 an hour of the 375-lb units, are processed in this setup. Setting has an operating capacity of over 5200 lb per hour of material galvanized.



CONTINUOUS WIRE MESH galvanizing is performed in this setting. Steam jets blow off excess zinc as screening moves out of pot for cooling cycle.

heat over the pot surface to compensate for local losses as from vents, etc.

In a continuous galvanizing operation where material flow enters one end of the setting and exits at the other, heat input should be concentrated at the charging end with diminishing requirements as the cycle progresses.

Zinc allowed to solidify in a kettle should be remelted from the top. Top metal becoming molten expands upward, whereas, metal heated at the bottom cannot displace the metal above it because of the weight involved. It expands outward and downward against the kettle, causing it to bulge. Bulging causes welds to crack, contributing to destruction of the pot.

Always present in bottom heating is the possibility of high pressure developing, causing molten zinc to blow out with considerable force when the top finally melts through.

Burners should be concentrated near the top, which, due to pot losses, is a high heat requirement area. Correctly installed burners are spaced to radiate their heat evenly, assuring uniform heating of the kettle. Because of complete combustion within the radiant cup, cumbersome bridge walls and firing baffles are eliminated.

Why output is high

In one installation fired by Selas Duradiant burners 13 to 14 sheetmetal burial vaults weighing 375 lb each are galvanized per hour. The same setting is used for processing 23 to 25 vault bases per hour, each weighing 125 lb. An operating capacity of over 5200 lb per hour of material galvanized is being realized.

Operation is manual with semi-automatic handling and dipping equipment. Uniformity of coatings has been made possible by relative freedom from the results of temperature fluctuation. Thin coatings resulting from excessive temperature and heavy coats from low temperatures have been eliminated by maintaining a bath temperature of 870°F with a tolerance of 5°F.

The pot is of welded 2-in. steel plate, measuring 5 × 5 × 14 ft and holding 80 tons of molten zinc. Twenty-six burners are arranged in the furnace setting side wall with 13 burners in two rows on each side of the pot. Operation and heating requirements dictate that burners be patterned evenly along the length of the pot face with the majority applied near the top to overcome pot losses.

Maintenance of this setting during the past 4 years has consisted mainly of replacing a few burner tips. The pot has operated since 1949 and is expected to last at least one year more.

A steel wire mesh screening galvanized installation operates continuously. The pot has a rounded bottom and sides are tapered toward

the center. The wire screen is conveyed over rolls at one edge of the pot, carried down through the zinc bath, underneath a second roll near the bottom of the pot and then back to the surface. Steam jets blow off excess zinc as the screening travels vertically through the cooling cycle.

The setting is designed to handle two strips of 48-in. wire cloth abreast of each other. Strip speed varies from 5 to 40 fpm with the weight of the strip varying from 12 to 105 lb per 100 sq ft. The setting is rated at a maximum production of 3600 lb of steel screening per hour, plus remelting capacity for 1400 lb of zinc replacement per hour.

Bath temperature is important

The setting is equipped with 32 burners mounted in the two side walls, three rows of burners on each side. Gas-air mixture is supplied to the burners through 12 Selas low pressure inspirators. Bath temperature of 875°F is maintained by uniform heating of the kettle and proper patterning of the burners, plus rapid chamber response to control.

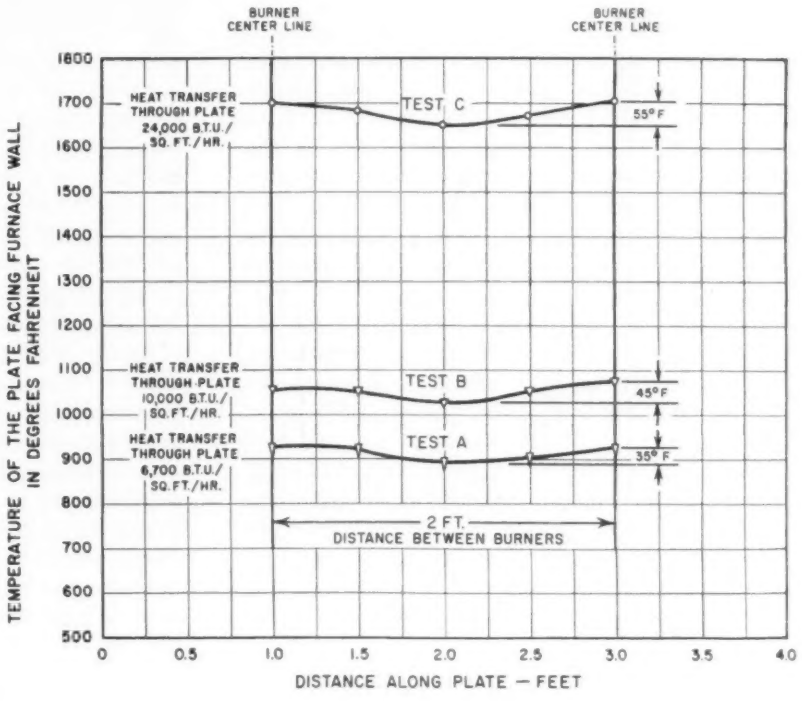
In another similar but smaller operation, designed production is 1000 lb per hour of steel wire cloth. Made of 1½-in. fire box steel plate, the pot is 2 ft 6 in. wide × 4 ft deep and 11 ft long with a capacity of 23 tons of zinc. The installation began operating in 1947 and the original pot was replaced last year after 5 years of service. This installation is used intermittently for coating specialty items.

By converting one of two identical settings to Duradiant firing comparative cost figures have been attained. Both hand dip production type settings have rated production capacity of 3500 lb per hour. The conventional setting consumed approximately 1850 cfh of 1000 Btu natural gas as compared to only 1350 cfh consumed by the Duradiant-fired setting. Chamber temperature of the conventional setting approached 2200°F while the chamber of the converted setting was uniformly maintained at approximately 1450°F.

Comparing these installations, pot life of the conventional setting was approximately 6 months compared to 14 to 16 months for the Duradiant-fired setting. Dross formation with the conventionally fired setting amounted to approximately 14,000 lb per month as compared to about 6300 lb per month with the converted setting.

Since this is a manual operation, work pieces are hand dipped in different portions of the bath. Good, consistent galvanizing requires that bath temperature be maintained uniformly throughout the pot. Uniform heat transfer, proper burner positioning and close bath temperature tolerances have resulted in good galvanizing with reduced dross formation and gas consumption, plus extended pot life.

Laboratory tests were conducted to determine the uniformity of heat distribution of radiant firing on a kettle face. Kettle face temperatures are compared with burner locations along the plate in the drawing. Burners were positioned in the furnace wall approximately 14 in. from the plate face. Curves A & B represent normal galvanizing conditions. For heat transfer rates of 6700 to 10,000 Btu per sq ft per hour through a 2-in. steel plate with burners on 2-ft centers, a face temperature variation of only 35° to 45°F was recorded on a line between centers of the burners.



TESTS of heat distribution on kettle face showed uniform transfer of heat from radiant burners.

Handles tough alloys, too—

◆ The growing number of shapes and tube forms produced by the Rockrite process indicates a wider field for application of the process to design and production problems . . . A wide variety of gear and cam shapes, tapers, inside upsets, outside stepdowns are being made.

◆ Improved mechanical properties resulting from this "cold forging" type operation, plus close dimensional control and superior surface finish, permit reductions in material requirements and machining time.

Cold "ROCKING" Answers Design, Production Problems

By K. W. Donle
Chief Metallurgist
Tube Reducing Corp.
Wallington, N. J.

◆ RECENT EXPERIENCE in the cold compression forming of tubing and tube forms by "rocking" have opened a wider field for application of this method to modern part design problems. Three developments have made this possible: (1) Experience gained in production of "hard to make" parts. (2) Successful experience in the cold reduction of "hard to draw" materials, including titanium. (3) Development of new and more powerful machinery which ultimately extend the size range of products which may be produced by this method.

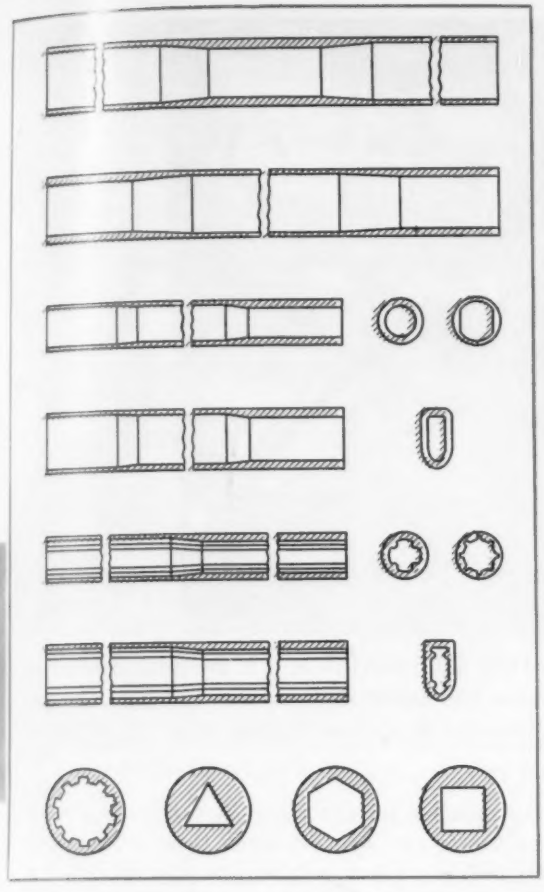
Many of the parts have a combination of unusual inner contours, lengths and diameters and could not be made as economically by other methods. By making use of increasing latitude in inner contours, plus the mechanical properties and close tolerances characteristic of cold compression formed tubing, economies in metal requirements and machining time are possible. Die costs for Rockrite dies compare favorably with die costs for other cold forming operations.

Compression formed tubing differs basically from cold drawn tubing. Tubing produced by Tube Reducing Corp., Wallington, N. J., by the Rockrite process, is essentially a cold forged product. Finished tubing is closely dimensioned, has improved physical characteristics resulting from cold working, and has a superior finish.

Properties of cold worked steels are affected by the process used. In cold drawn tubing, the metal is in tension. Maximum reduction per pass, about 40 pct, must be held within limits of the material's tensile strength or the tube will pull apart. In rocked tubing, reduction is limited only by the ultimate compressive strength of the material. Single pass reductions in excess of 85 pct can be made on carbon and stainless tubing.

In the rocking operation, dies roll back and forth over a stationary tube. The dies have a tapered groove around half their periphery. The groove at one end is slightly larger than the outside diameter of the tube to be sized. The groove narrows and at the other end of the die is the proper size for a desired tube diameter.

The mandrel against which the tube wall is squeezed is also tapered. This permits the tube, as it elongates, to feed free of the mandrel. As the dies roll along the tube, the narrowing die grooves compress the tube walls against the



VARIETY of inside and outside contours, tapers and upsets have been developed.

mandrel. Outer and inner diameters and wall thickness are reduced. Tube length is increased. Clearance between dies and mandrel determines finished tube wall thickness.

To provide draft, the tube is intermittently fed forward through the dies and rotated about one-sixth of a turn. Alternate feeding and indexing spreads the compressive cold working evenly over the entire surface of the tube.

The effects of this method of forming are reflected in the changed microstructure of the metal. A finer grain is developed. The large reduction per pass substantially thins out the decarburized layer, and minimum machining is needed to remove the decarburized skin left.

This method of cold forming, with its heavy reductions per pass, develops mechanical properties considerably greater than those normally produced by cold drawing. Applications requiring high strengths without heat treating make use of this characteristic. Normal mechanical properties for 52100 tubing rocked in reductions of 60 to 75 pct, range from 101,000 to 118,000 psi yield at an extension under load of ½ pct total strain and 140,000 to 167,000 psi ultimate strengths. Elongation is affected by specimen cross-section but for average sizes varies from 7 to 13 pct in 2 in.

In normalized or subcritically annealed material, ferrite and pearlite grains are elongated by compressive forming. In a properly spheroidized high carbon chrome steel, such as 52100, there is no noticeable effect on microstructure after cold working by this method. However, work hardening of the ferrite matrix tends to eliminate the "gummy" effect of ferrite in the machinability of this type material. This fact has largely contributed to the increased use of 52100 Rockrite tubing for anti-friction bearings.

Titanium tubing "rocked"

Yield strengths of eight starting tubes and eight finished, X-1020 steel, compression-worked tubes are shown in the table. While these figures cannot be used "as is" for design purposes, they do indicate the change in yield strength resulting from cold "rocking." Correspondingly high mechanical properties and close tolerances can also be obtained in tubes made of alloys which cannot be successfully rotary pierced. If such be the case, a large, heavy-walled blank can be centrifugally cast, hot extruded, or welded.

The relatively small amount of motion between the die and tube have made cold reduction of many "hard to draw" metals practical. High temperature alloys with high nickel-chromium content and other materials difficult to cold draw are being compression rolled. Zirconium and zirconium alloys have been successfully rocked. Titanium tubing, difficult to cold draw because of its tendency to seize or gall, has been successfully worked by the tube reducing process.

Both inside and outside surfaces of rocked tubing have a fine finish. A slight amount of controlled slippage between die and tube burnishes the outside. Repeated striking of the inside surface against the polished mandrel produces a planishing action. Surface defects are ironed out. In some cases, surface finish profilometer readings as low as 5 microinches have been attained. The fine surface finishes, linked with close bore tolerances, have been used to advantage in parts such as hydraulic cylinders. Honing is reduced to a minimum.

Process permits design latitude

A growing advantage of the process is the increased design latitude permitted. Experience accummulated in the past 5 years has greatly extended the possibilities for production of closely dimensioned parts with unusual contours, and lengths.

Some typical contoured parts include overrunning cams, internal gears for pumps, hydraulic cylinders, and tools and ring-shaped parts. Many aircraft parts are being made from compression formed tubing, because of its higher strength for weight. The method and rocked materials are being used to produce spars for helicopters, braces and struts for landing gear, and tubing for making rocket and jato bodies.

Many special products have been developed which could not be made by conventional cold

forming methods. Continuous tapered sections for use as propeller cores are cold formed in several passes. Forming starts with a 36-in. machined, tapered forging about 7½ in. in diam and with a 1⅛-in. wall. The forging is hot upset at one end, then bored and honed and the outside diameter turned and polished. Three passes on the Rockrite machine elongate the original shell to about 100 in. While unchanged at the butt end, the shell tapers to 5.031-in. OD with a 0.038-in. wall at the opposite end.

Two characteristics of the process are especially valuable in this application. The concentricity inherent in the process provides a vitally necessary balance in the shell. Freedom from surface defects, a characteristic of the process, prove a distinct advantage since the core is the stress bearing member of a steel propeller.

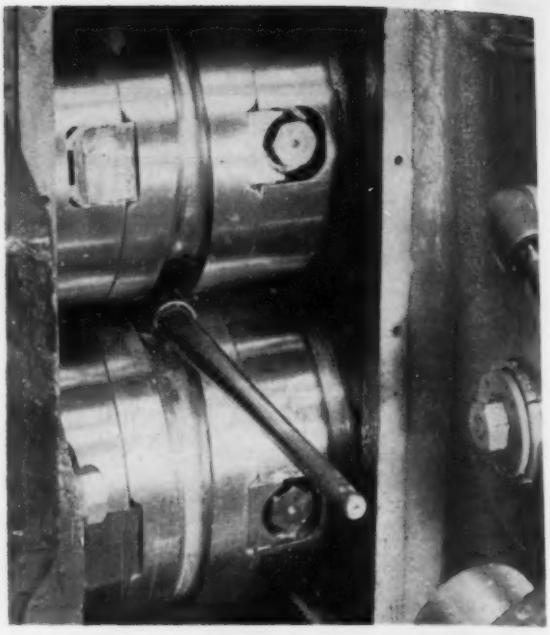
Compression sizing improves the concentricity of hot pierced tubes. Eccentricity of the reduced tube will be less than 5 pct when made from hot-finished tubing within commercial tolerances of 12½ pct. Close tolerances on diameter and ovality are obtained even in thin wall to diameter ratios. Tubes have been rocked with wall to diameter ratios of less than 1 to 100.

Close dimensional control is an important factor in the wider use of this type of cold forming. Outside diameter variation in any given section of a reduced tube is normally less than 0.005 in. in sizes as large as 3½ in. outside diameter. However, to allow for reasonable die life, rocked tubing is normally held to 0.012 in. total outside diameter tolerance.

A step-tapered SAE 4130 spar tube, load carrying member for the rotor on the Navy's HUP-2 helicopter also benefits from these process characteristics. The spar's length, 259 in., takes advantage of the ability to produce tubing of almost any length. Tubing lengths up to 45 ft are normally produced by the Rockrite process. Longer lengths can be produced in certain sizes.

The stepped-diameter tubing, over 21 ft long when completed, starts as a shell 3¼ in. in diameter with walls ½ in. thick. The hollow shell is bored and honed and the outside diameter turned and polished before the first reduction. The spar is made in a series of passes, each producing a step having a required diameter and wall thickness.

Hub diameter of the spar is 1⅞ in. with an 0.203-in. wall. At the outboard end the spar has a 1-in. OD with an 0.038-in. wall. The tapered section is essential to maintain uniform strength

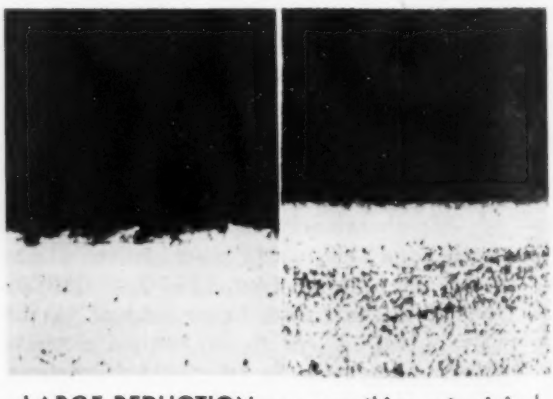


TUBE ELONGATES as it is compressed between dies and mandrel. Clearance between dies and mandrel determines finished tube wall thickness.

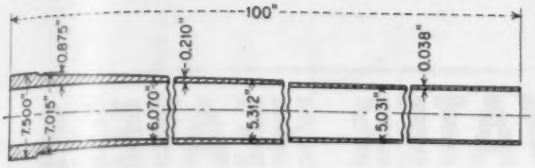
YIELD STRENGTHS COMPARED
(SAE X1020)

Starting Tube, psi	Compression-Formed Tube, psi
58,300	107,400
44,300	108,000
41,300	102,900
41,700	105,000
42,200	106,900
41,400	103,200
45,000	108,800
41,500	104,400

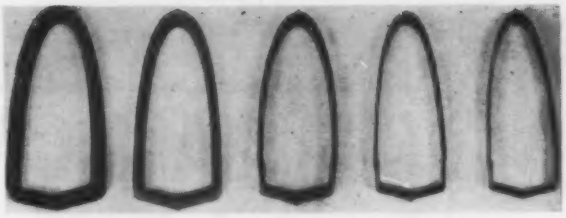
CHANGE in microstructure caused by cold compression forming is compared. At left, starting tube. Right, Rockrite processed tube. 200X.



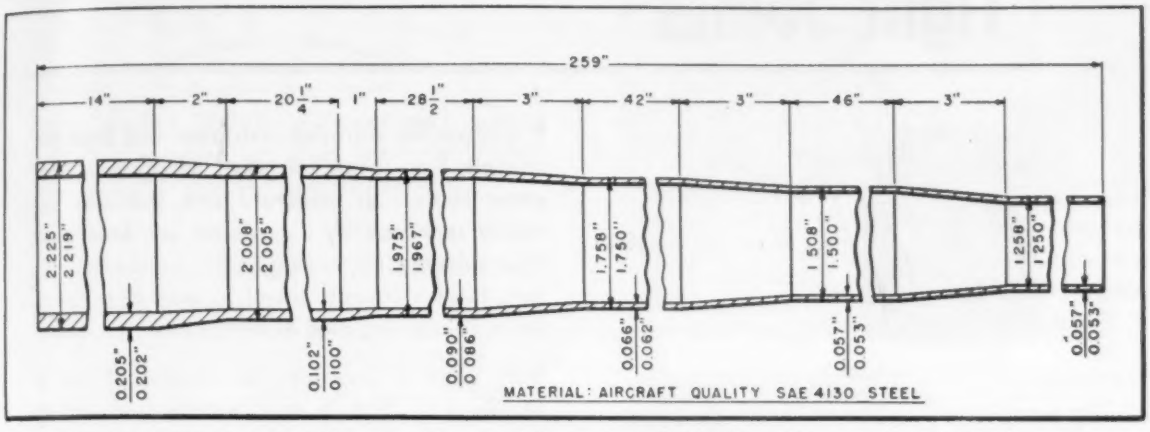
LARGE REDUCTION per pass thins out original decarburized layer, left, as indicated, right. This helps cut down later machining.



STEEL PROPELLER core is a continuous tapered section. Production starts with a 36-in. machined and tapered forging.



AIRFOIL SECTION is made in a series of passes on the Rockrite machine, starting from billet, left, followed by a total of four passes.



HELICOPTER SPAR TUBE, more than 21 ft long when finished, combines series of stepdowns.

CAMS, GEARS and other ring-shaped parts are made from typical tube reduced forms.

with relation to load as it it is reduced along the length of the spar.

Wall thickness can be varied along the length of the tube. Tubes with increased wall thickness at the ends and lighter wall near the center can be used at advantage for applications such as light weight bicycles, where heavier tube ends may be required for welding.

For applications involving bending, tubes have been formed with wall thickness greater in the middle than at the ends. Greater thickness in the bend area compensates for thinning which may result from bending

Internal shapes — other than round — are produced by varying the shape of the mandrel. Rocked tubing with an octagonal bore is a typical shape. This shape was used for production of large quantities of tank track bushings. Use of a closely dimensioned octagonal bore greatly reduced the broaching required and permitted savings in both material and production time.

During World War II a configured inside diameter was produced by the Germans in carbon steel gun liners. Rifling was rolled in rather than broached in. Excellent results were reported.

Another unusual part now being developed is an airfoil section. A cross-section resembles an elongated "D." It is worked in a series of passes through the Rockrite machine.

Until recently, maximum tube diameters which could be produced on the tube reducing machines has been 6 in. Now however, with the recent development of an 18 in. machine, maximum diameters which may be handled will be considerably increased. By 1954, a maximum outside diameter of 17 in. will be attainable on the larger machine.

Half copper, half steel—

BIMETALLIC WATER HEATERS Brazed for Strong, Tight Joints

By Albert H. Trageser
President
Trageser Copper Works, Inc.
Maspeth, N. Y.

◆ Copper for corrosion resistance and steel for strength have been combined to produce hot-water heaters at moderate cost, yet with excellent serviceability . . . Joints are brazed or silver-soldered, depending on the metal combination, to give strength equal to more than twice the maximum imposed in service.

◆ By using a Gasfluxer, no dipping of rod is necessary . . . Flux, in liquid volatile form, enters the acetylene line so that protection is adequate when the flame is applied to the joint . . . No joint cleaning is necessary after brazing.

◆ COPPER HOT-WATER TANKS were fine because they gave no corrosion or replacement problems. But steel tanks, being lower in cost and easier to work, virtually pushed copper tanks off the market. With the high cost of one and poor corrosion resistance of the other, the engineering staff of Trageser Copper Works, Inc., Maspeth, N. Y., set out to design a tank which would satisfy both the requirements and pocketbooks of homeowners. They did it with a compromise—steel for strength, copper for corrosion resistance.

The simplest approach to bi-metallic construction proved most satisfactory. A relatively thin copper shell is slipped into a heavy steel casing. Bi-metallic concave dished heads are inserted in the ends with the copper portion inside the finished tank.

A heavy-walled pure copper tube extends from the fire-pot to the draft diverter at the top and serves as a flue. Baffles in the flue retard the upward flow of hot gases, allowing time for maximum heat transfer between the copper and water. This construction provides copper-to-water contact throughout the heater. Four brass spuds serve for pipe connections. The copper-lined steel casing is contained in a steel baked-enamel jacket. Between the steel casing and the jacket is a thick layer of Fiberglas to confine heat.

Structurally, the design assures a lifetime of service. There is nothing in the copper core to rust, flake or crack. Water becomes heated quickly because it contacts the high-conductivity copper flue and thorough insulation keeps water hot. The homeowner benefits by the combination of fuel economy with assurance of lifetime service.

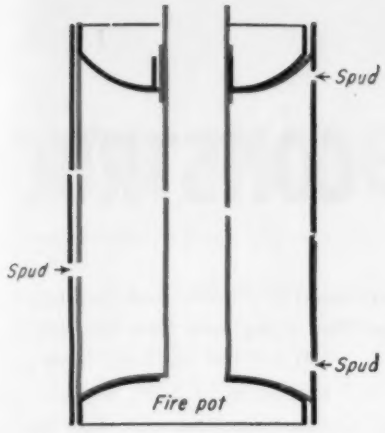
All heaters are tested for maximum safety with pressures of 350 psi, which is more than twice the maximum pressure required in service. The design is such that all the strain is taken by the steel.

Water tightness is a rigid requirement for all connections on the copper core inside the steel casing. It is essential that such connections be permanently and tightly sealed, and free from crevices or porosities, because they are totally enclosed and inaccessible for inspection or repair.

Some of these connections are copper to copper or brass while others are copper to steel. After studying the conditions, torch brazing was considered best. The filler rod used is low-fuming bronze for joining copper to steel, and a silver-brazing alloy for copper to copper and copper to brass.

An automatic vapor fluxing technique has been adopted for the brazing operations. Flux in volatile liquid form is contained in a Gasfluxer, which is connected into the acetylene line leading to the torch. Acetylene passes through the flux chamber of the dispenser and automatically picks up a regulated amount of flux.

Since the flux is in the flame, there is always enough flux on the work as long as the flame impinges on it. There is no scale or oxide to clean away after the braze is completed. No time is lost dipping the brazing rod in flux so



STEEL OUTER SHELL reinforces pure copper shell. This combination gives hot-water heater extra long life and exceptional strength.

that brazing is continuous and uniform, resulting in tight, nonporous joints.

In making the shell of the copper inner tank, pure copper sheet is cut to size and rolled to form a cylinder. This is assembled in a brazing jig with the edges overlapping and a preplaced ribbon of silver-brazing alloy between. This procedure assures complete penetration of the joint by the brazing material.

A small amount of phosphorus in the brazing alloy effectively prevents oxidation within the joint. Use of the vapor-flux technique with this material yields a cleaner and more ductile joint.

How parts are assembled

After the copper shell is inserted in the steel outer casing, the four spuds for pipe connections are assembled to it. The spuds are then brazed to the copper on the inside. This being a brass to copper connection, silver-alloy brazing rod is used.

The top end subassembly is a steel dished head fitted inside a copper head, with a copper sleeve inserted at the center. On the steel side the sleeve is brazed to the steel with a low-fuming bronze rod.

The bottom end, also a composite of copper and steel, is assembled to the copper flue in a vertical jig and the braze is made on the steel side with the bronze rod. After the top end has been inserted into the shell and welded, the bottom end is inserted, the flue passed through the upper copper sleeve and later silver brazed to it to complete the tight seal of the copper core.

Top and bottom circumferential edge welds are arcwelded manually. The extra high test pressure to which the tank is subjected sets the copper core solidly against the casing and at the same time demonstrates that the brazed connections are fully capable of carrying the imposed loads.

INNER TANK is cut from pure copper sheet and rolled into a cylinder. Brazing is done by overlapping edges and preplacing ribbon of silver brazing alloy. Rod is added only if needed.

BRAZING SPUD of special design is done from inside of copper shell. Since this connection is brass to copper, silver-brazing rod is used.

COPPER FLUE is being brazed to bimetallic dished head from the steel side. Use of liquid volatile flux leaves a clean, tight joint.

Cut maintenance costs—

BETTER TANK CONSTRUCTION

By Manson Glover

President
Glover Coating Co., Inc.
Malden, Mass.

◆ Your investment in organic and synthetic linings for corrosive solution tanks may form the largest part of tank costs . . . You can get the most from your investment, and cut maintenance costs, by following a few simple tank design principles . . . Top quality workmanship in making tanks shells and applying linings is a must.

◆ Aim of tank design and construction should be a close, permanent bond between lining and shell . . . All surfaces, including welds, must be smooth to avoid entrapped air when lining is applied . . . Portions of tank which may not be accessible after installation should also be protected from corrosion.

◆ GOOD TANK DESIGN and workmanship, and close adherence to some basic principles in lining application, can substantially lengthen the service life of steel tanks lined with rubber, synthetic rubber and other plastic materials. Improved resistance to corrosion and abrasion, plus good insulating properties, have been important factors in the widespread use of these materials.

Most lining work on industrial tanks is done with rubber, Neoprene and Koroseal. Rubber is applied in sheet form or by spray, soft or semi-hard. Soft rubber linings are suitable for relatively mild conditions, where no oil is present, and for operating temperatures to 150°F. They are normally indicated to handle abrasion. A pad of soft rubber applied to the top rail of a tank which has a hard rubber lining will prevent tools, containers and work pieces from chipping the protective covering at top edge.

Semi-hard rubber is suitable for temperatures to 180°F. This temper is rigid but has some flexibility—it does not shatter. Neoprene, a synthetic rubber, is useful for temperatures a little above the natural rubber limit. It is resistant to oils, solvents, and sunlight.

Koroseal, a dense, tough plasticized polyvinyl chloride, is not a rubber derivative and contains no rubber. Koroseal has good insulating properties and is suitable for temperatures to 150°F. It is resistant to nearly all chemicals which rubber can handle, plus chromic and nitric acid.

Plastisol is a vinyl resin dispersed in a nonvolatile liquid plasticizer. When heated to its critical temperature it fuses into a resilient solid with practically no loss of weight or volume. In other applications the thermoplastic vinyl lacquers and thermosetting Bakelite lacquer may be useful.

Each material is highly resistant to numerous strong corrosives and is of special use in particular applications. An important specification is that in the process service for which it is indicated the lining will not break down and contaminate products. This is often the deciding factor in use of nonmetallic coatings.

For some corrosive conditions there is a choice of two or more; for others there is a definite preference. Most reliable guide to selection is field experience. In making a selection, it is necessary to know about many other service conditions besides the chemical composition of the contained material. Working pressures and temperatures, conditions of motion and aeration, presence of impurities or process by-products, all have a bearing. Poorest basis of selection is cost of the lining alone. Percentagewise there is not an important difference in the costs. Real economy lies in using that material which will give longest service under projected conditions of operation.

Normally the tank fabricator ships the tank to a coating plant such as Glover Coating Co., at Malden, Mass. After it has been lined, the tank is returned for installation of fittings or attachments before delivery to the customer.

First step is to clean and smooth all surfaces to be covered. Some grinding and filling may be necessary on welded work. Surfaces are sandblasted to remove dirt, rust and scale

METHODS INCREASE LINING LIFE

just before lining work starts. Adhesives should be applied before oxides form. Time needed for surface preparation depends on tank condition when received and is an important cost variable.

For sheet rubber lining a series of adhesives must be used because no single adhesive will make a tight bond with both steel and rubber. The bonding intercoat is built up on the steel surface, allowing proper drying time between layers. Two coats of steel primer and two coats of cement are usually applied.

While the tank surface is being prepared with adhesives, the rubber sheet is cut to size and the edges skived. Where adjoining sheets come together, a lap seam is used. Similar joint designs are used at corners. No square butt joints are left uncovered. The cut sheet is washed with naptha, coated with cement, and allowed to dry enough so that it can be rolled up without sticking together. Each piece is then rolled onto the prepared steel surface, taking care to make complete contact as the sheet is rolled on, and to avoid entrapped air pockets.

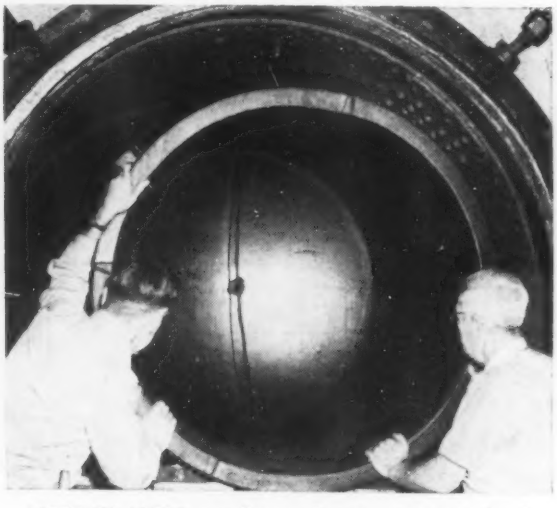
When the lining is in place it is vulcanized to the steel. The vulcanizer is a large autoclave, designed for maximum pressure of 125 lb and temperature up to 275° to 300°F. Normal working pressure for vulcanizing rubber linings is 75 lb. Steam is supplied by a separate gas-fired boiler. Hard rubber linings are cured at 290°F for 3 hours; soft rubber at 260°F for 1 hour.

Rubber linings and coatings can be sprayed on steel prepared in the same manner as for the application of sheet. Any thickness can be built up by a series of sprayed coats. It is then finished by vulcanizing.

Small objects may be rubber coated by dipping in liquid latex after being prepared with

SPARK TESTING for pinhole leaks in sprayed lining of a 1500-gal tank. It's a 10,000-v spark.

SPRAY APPLICATION of latex rubber to a chemical processing vessel. For some tanks, spray may be the only practical application method.



AUTOCLAVE is used to vulcanize a typical rubber lined open-top tank. Curing temperature and time determine "temper" of rubber lining.

"Complete contact between the steel surface and the lining material is essential . . ."

adhesive. Dipped coatings are vulcanized if a hard rubber coating is desired and cured in dry air to obtain a soft rubber coating. Procedures for applying Neoprene are very much the same as for rubber, with some differences in temperatures, time, and pressure.

For Koroseal linings, sheets are cut to size and a series of adhesives applied to the steel surface and to the Koroseal, allowing each coat to become tacky before applying the next. Koroseal sheet usually has to be warmed to make it pliable enough to work. The warm sheet is rolled onto the metal, taking care to make contact continuously so that no air pockets are left. Edges are cut square, forming a square butt joint where the sheets come together. Over this joint an extruded Koroseal seaming strip is applied by rolling and progressively fusing it to the lining.

The seaming strip is threaded through the handle of the rolling tool. Heat source is a hot air torch, in which air at 3 to 4 psi is heated to 400° to 450°F by passing over an electric heating element. The hot air is introduced under the seaming strip as the strip is slowly rolled down. It melts the edges of the lining and the lower portion of the seaming strip. Under pressure of the roll all spaces are filled, resulting in a homogeneous mass with no interruptions from one end of the joint to the other and with no dependence on adhesives. For corner joints, the same procedure is followed using a seaming strip and rolling wheel of different shape.

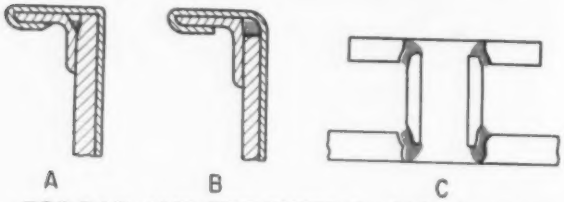
In addition to visual inspection, a 10,000-v spark tester is used to test for leaks. When all seams have been satisfactorily fused, the lining is ready to go to work—no vulcanizing or other curing operation is necessary.

Plastisol linings are used where dimensions do not permit sheet work as in narrow, deep tanks. The work surface is sand-blasted, adhesives applied, and the entire tank heated to 225°F for heavy work or 375°F for light work. It is dipped while hot, the excess is drained off, then it is heated to 350°F, at which temperature the Plastisol sets. Heavy sections are heated slowly in order not to burn the outside before the inner portion comes up to the critical temperature. Heating is done in a circulating hot air oven.

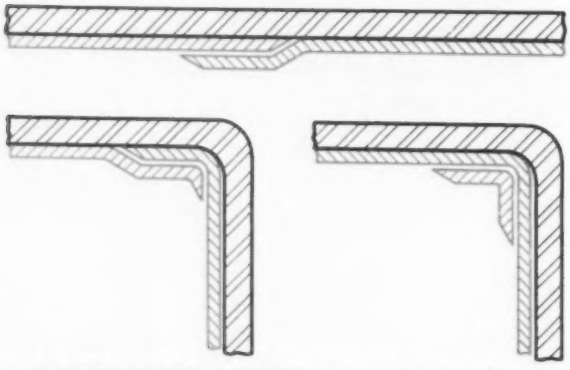
How blisters start

Complete contact between the steel surface and the lining material is essential. Porous spots or voids in which air or cement solvents can accumulate will cause trouble. The gas expands with any important rise in temperature and raises blisters in the lining. Sharp corners inside the tank would be a definite source of gas pockets, because it is difficult to fit the lining material snugly into such corners. Abrupt protuberances are another source of trouble. The need to avoid these sources of gas pockets places special emphasis on getting smooth, solid surfaces with no sharp angles.

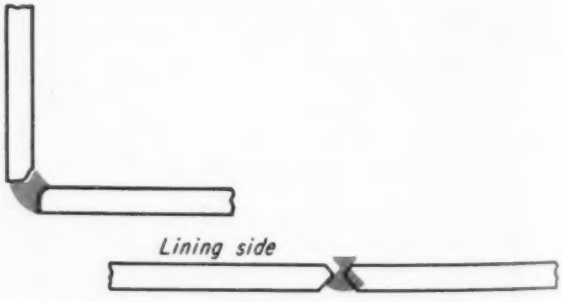
Tanks which are to be lined require more fabrication care than those which are to be painted. This places special emphasis on good tank joint design and superior workmanship in welding. For corners in walls and bottoms of tanks, full penetration and smooth, rounded fillets make a high strength joint that will not work loose if tank walls flex due to temperature or pressure changes.



TOP RAIL AND SIDE SHEET should be level, as at A, when rubber lining is used. Put top rail, B, above side sheet when Koroseal is used. At C, is good nipple design for inlets and outlets.



RUBBER SHEET JOINTS are made by skiving edges, of sheet, then lapping. No butt joints are left uncovered. Similar joint is used at corners.



RECOMMENDED WELD JOINTS for corners and bottoms of tanks. Use double welds for butt joints. Grind inside reinforcements flush.

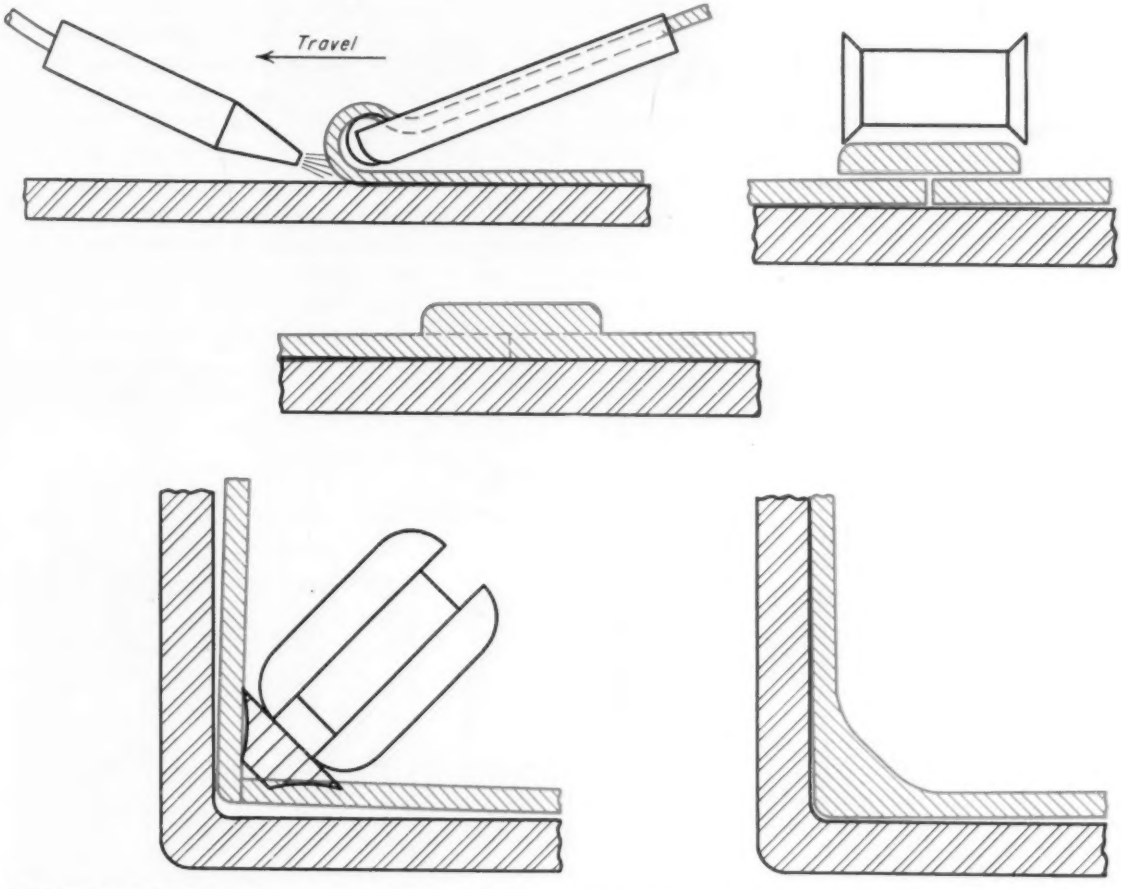
If welding is properly done, there will be no crevices through which corrosion from splash or from atmospheric moisture can work inward and create pockets under the lining. There are less costly ways to weld a tank, but with the lining costing three or four times as much as the tank shell it is more important to save the lining than to skimp on the tank cost.

Much corner welding can be saved when the tank is small enough to be partly formed. This type of formed shell is ideal for lining if the inside radius is not less than ⅛ in. For butt joints, double welding is recommended. Any inside reinforcement should be ground flush.

A good design for joining the top rail to the side sheet of a tank to be rubber lined is shown in the sketches. The rail, usually an angle, is scarfed at intervals with a cutting torch, to make 2 in. long grooves for intermittent welds. The angle is set flush with the top edge of the side sheet. Welds are ground flush, and the rubber sheet is brought over and around the horizontal leg of the angle. For Koroseal lining, the top surface of the angle is set above the top edge of the tank shell. In the slight groove formed a continuous weld with a convex surface is deposited. This design favors longer lining life needed at a point of wear.

HOT AIR WELDS Koroseal sheet and strip into a homogeneous barrier. Strip feeds through lower tool. Hot air is fed from upper tool.

Stiffening ribs if needed, usually angles or channels, should be welded to outside tank walls, where they will not present a lining problem and where staggered intermittent



SEAMING STRIP for Koroseal lining is rolled fused on. Strip is threaded through handle of rolling tool. Heat from hot air torch melts edges of lining and portion of strip to form weld.

Best design calls for complete welding of every seam which is to be covered with lining . . .

welds can be used. In some cases pads, partitions, dams or baffles must be welded to the inside surface. Such welding should be done by depositing a continuous fillet all around, using an electrode and a technique which will produce a concave fillet.

Sectional tanks, removable exhaust casings, etc., should be accurately fitted and match-marked before lining, so that linings will not be twisted loose from the plate when assembly bolts are tightened.

Best design provides for complete welding of every seam over which a lining is to be applied. Welding procedure should preserve alignment of sheet surfaces on butt welds. A tolerance of 25 pct of plate thickness (⅛-in. misalignment) is permissible in some specifications but does not reflect best welding practice. Weld beads should be solid, nonporous, smooth, of uniform contour, free from lumps, spatter, undercuts or pockets. Peening is permissible for closing minor weld porosities if the weld itself is strong enough for the service conditions.

Sharp ridges should be ground off. Minimum radius for all inside corners should be ⅛ in. If necessary, grinding should be used to get sufficient radius. Tank plate should be of good quality and free from dents or buckles. If welding is used to fill surface defects, the weld should be ground flush.

Costs of tank linings are subject to several variables. Plain, properly fabricated tanks which will take linings which can be cut to standard widths with very little waste are least costly. Jobs requiring much fitting time, as a tumbling barrel in the shape of a truncated pyramid, fitted with a dished head having inside ribbing, are more costly.

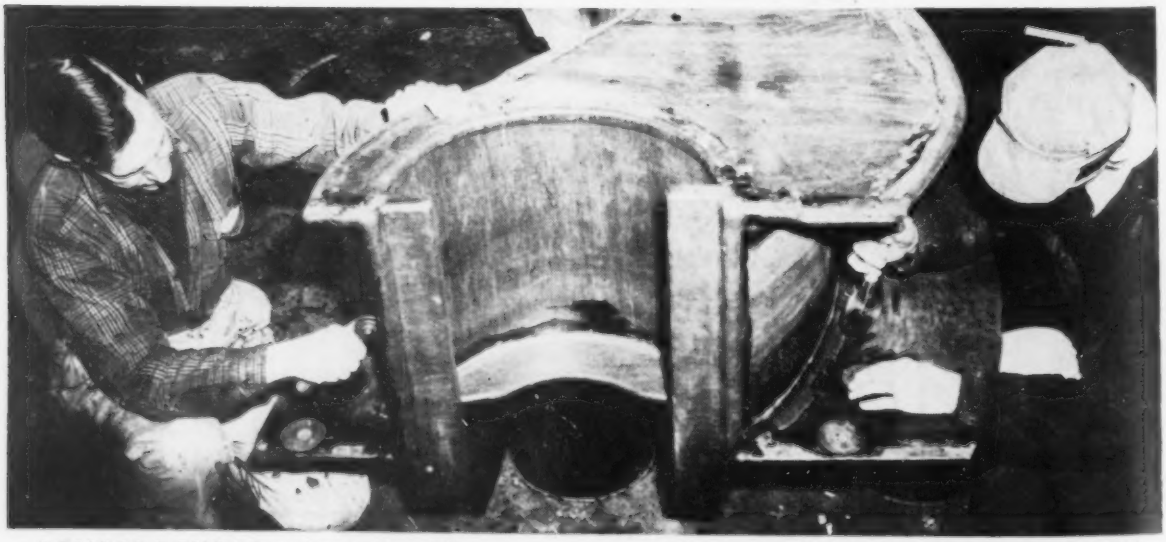
A rough comparison of costs on a small, plain rectangular tank in various materials including rubber and Koroseal-lined low carbon steel is shown in the accompanying table. The figures are by no means precise—they would vary considerably for different thicknesses of linings—but they indicate the approximate difference in cost for several types of construction. Tank costs are not in direct proportion to material cost and organic lining is not cheap construction. However, when used where applicable, these linings may show the lowest cost per year of tank life—provided proper installation and maintenance is applied.

Tanks designed to hold corrosive materials should be painted outside with a suitable corrosion-resistant paint. An outside organic sheet or spray coating may be advisable in some cases. Tank bottoms should be insulated if there is electric current flowing, as in plating. Bottoms, sides or ends not accessible after installation should be given an extra heavy coating. Corrosion will work through and spread under the lining if it once gets a good start. Some conditions call for splash aprons over the rail in addition to protective painting.

Mechanical damage to linings should be prevented. Breaks or cuts allow corrosive solutions to seep through and attack the metal. Insulated grids are helpful in this respect.

Comparative Tank Construction Costs

Material	Cost per Pound, ¢	Cost of Tank
Carbon Steel	6.7	100
Stainless Steel	35	250
Monel	60	400
Stainless Clad	30	200
Lead Lined		300
Rubber or Koroseal Lined		400-450



ROLLING DOWN the joints in the rubber covering of a beater arm. Covering was made from 3/16 in. semihard natural rubber sheets. Special care is needed to avoid entrapped air.

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GIVES YOU EXTRA HIGH QUALITY ON A 4-HI REVERSING MILL

Quality begins in the furnace, and on this modern mill the order of evolution is ingot to plate to coil, as the steel rolls back and forth to gain the exact gauge specified. Then out it runs to the finish coiler and to the customer. Two-thirds of a century's experience behind new integrated facilities ensures the highest quality. Central location and dependable, economical delivery over Waterail routes are additional reasons for making Newport your source of quality steel.

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Hot-Rolled Steel in Coil
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Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati ... With the advantage of location, new river barge facilities and seven major ... roads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

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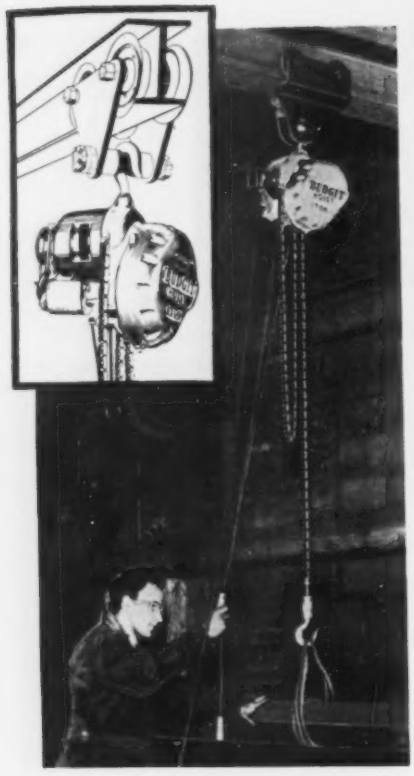

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The 'Budgit' Electric Hoist solves the problem wherever economy rules production. It is fast and powerful. In less than two seconds, a 250-pound load is lifted one foot by the smallest size 'Budgit'. One hand controls lifting and lowering action. The other is free to guide the load. No manual lifting. No lame backs. Such speed and safe operation help manpower boost daily production and reduce costs.

The 'Budgit' Electric Hoist is rugged, portable, uses little current. Installation is no problem at all. Just hang up, plug in, use. Save on every lift. No extras to buy—it's a complete hoisting unit that provides every safeguard for man, load, and hoist. Capacities: 250 to 4,000 pounds AC and DC models. Prices start at $129. See your nearby "Shaw-Box" Distributor for details or write for Bulletin No. 391.

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keep flexible conductor cord up and out of the way while carrying electricity to monorail hoists. Roll smoothly around curves, through switches.

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Technical Briefs

SHEETMETAL:

Valley construction important to good terne metal roofs.

One of the most important roofing jobs is making a good, sound valley to provide positive protection at the weakest point of any roof. The Follansbee Steel Corp. has set up procedures for constructing valleys of terne metal which can be used with any type of roof deck material. They should be installed on solid wood sheathing which has been covered with rosin-sized paper.

The material has good ductility which makes it easy for the roofer to form. Its lead-tin alloy coating gives it a high degree of corrosion-resistance, and the steel base makes it tougher than other roofing materials.

Construction Optional

The roofer has a choice of making one-piece or sectional valleys. One-piece valleys can be cut to the proper length from a 50-ft seamless roll of terne metal. After cutting the length, the outer ½ in. of each long edge should be bent up to a 45° flange. Bending should continue to 90°, and finally to 135°.

In constructing sectional valleys, metal is cut from a seamless roll into 8- or 10-ft lengths, depending on brake capacity. Corners are then notched and the outer ½ in. edge is bent upward to a 135° angle. Ends are also bent to the same angle, except that one flange is turned upward and the other downward for forming cross seams.

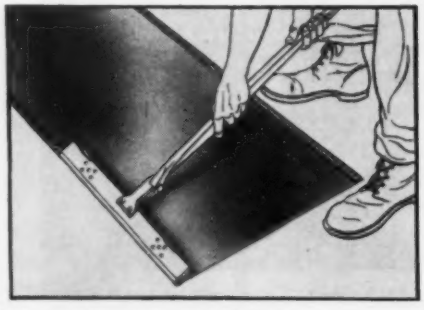
After preparing these sections, cross seams should be interlocked, malleted down flat, and thoroughly soldered with rosin or some other nonacid soldering flux.

Cleats Hold Valleys

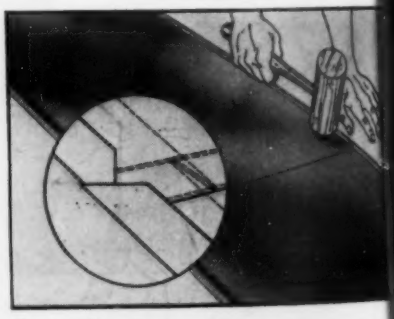
Now the valley, one-piece or sectional, is ready to be installed. The roofer marks a line lengthwise down the middle of the strip.

IF YOU WANT MORE DATA

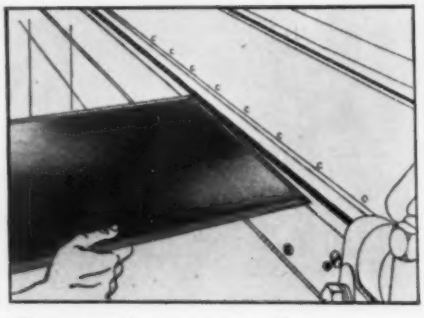
You may secure additional information on any item briefed in this section by using the reply card on page 139. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



Bend edges 135° . . .



Interlock seams . . .



One end up, one down . . .

Making the valley . . .

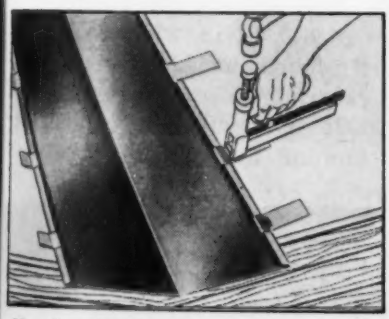
Using this line as a guide, he bends the strip to the proper angle to conform to the angle made by the junction of the roof segments.

The strip is then positioned on the roof. Excess stock must be allowed at the ridge and at the eaves. Cleats are hooked over the ½-in. flanges at intervals of 9 to 12 in. In the case of sectional valleys the seams must be placed so that the water flows over instead of into them. The cleats are fastened to the roof deck by means of staples or nails.

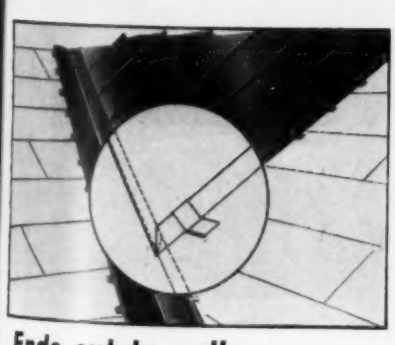
Forms Flat-Lock Seam

Where terne metal is used as the main roofing material, each pan should have its lower end cut at the angle at which it meets the valley. The outer ½ in. of the lower end is bent under to a 135° angle, then interlocked with the upturned ½-in. flange of the valley. This forms a flat locked seam, which is then malleted flat against the roof deck. The open edge of each seam should be soldered.

When completed, the terne metal roof will give long and endurable service because of its excellent corrosion resistance to all kinds of weathering conditions.

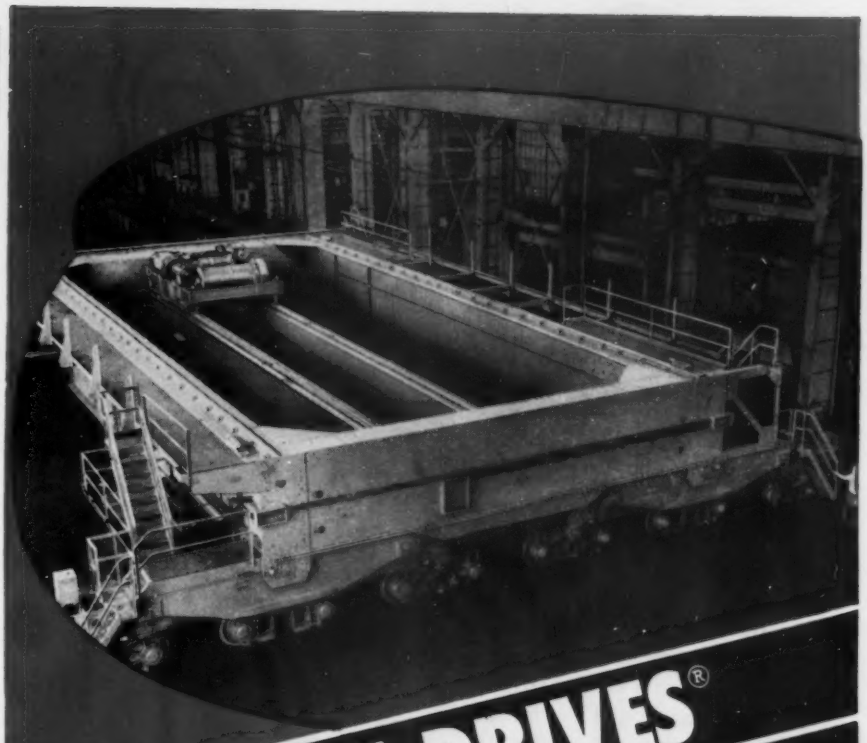


Hook cleats . . .



Ends cut to valley . . .

Turn Page



Ten CONE-DRIVES® give compact power to steel mill crane

Standard double-enveloping Cone-Drive gearsets and reducers have greater contact per tooth, more teeth in contact, increased load capacity, greater shock load capacity, longer life, lighter weight—and lower overall cost.

Ask for "Cone-Drive Gears at Work in Industry" (Bulletin No. CD-173) for case histories.

Morgan Engineering Company's 350-ton, 76-ft.-span ladle crane bridge features six individual 65-hp. motor drives that avoid line shaft designs.

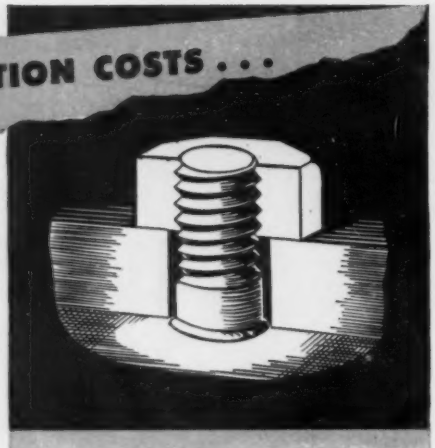
Key to the success of this design incorporating parallel drives is the 12-in. center distance, 12/1 Cone-Drive gearset in each drive that cuts space requirements, resists shock loads and provides ample safety factor for smooth, rugged, long life operation.

Cone-Drive gearsets are also included in the drives for the 200-hp. main trolley hoists and auxiliary 20-ton and 60-ton hoists.

This is another example of the trend to Cone-Drive gearsets and standard speed reducers in steel mill equipment. Designers and users alike benefit from their long life and high capacity in less space at lower cost.

CONE-DRIVE GEARS
Division Michigan Tool Company
DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS
7171 E. McNichols Road • Detroit 12, Michigan

TO REDUCE PRODUCTION COSTS . . .



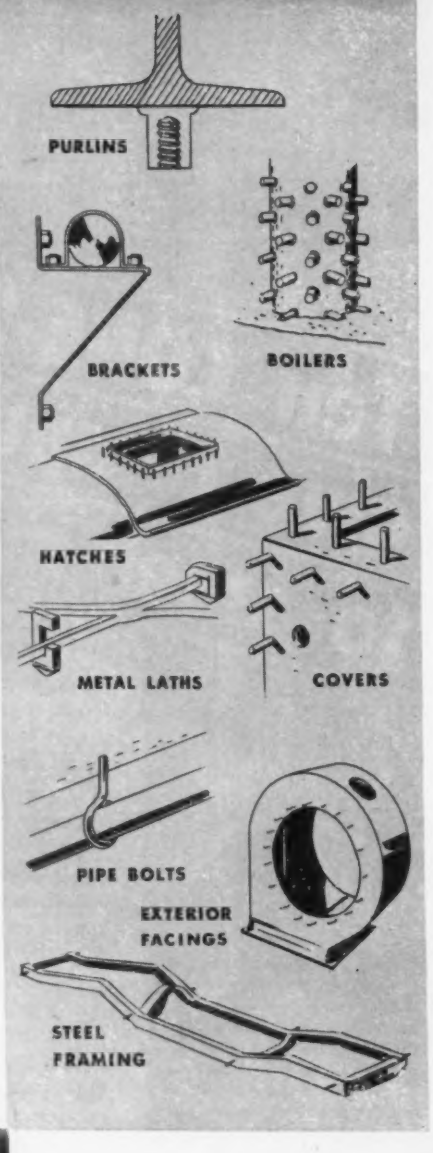
SIMPLIFY AND ELIMINATE WITH KSM STUD WELDING

Time-consuming drilling, tapping, grinding and the need for elaborate jigs and fixtures can be eliminated when stud welding is specified for fastening applications. Both design and assembly are simplified, production is boosted while substantial savings in labor and material costs are realized.

Stud welding is the efficient, fast application for plain studs, male or female threaded studs, with or without shoulders, eye-bolts, J-bolts, pins and a wide variety of square, rectangular, straight or bent shapes. Its applications are unlimited and have been thoroughly proved on countless applications.

Studs can be applied at the rate of six per minute and located within tolerances as close as .005 inches. True 90 degree positioning is assured. Weld strength exceeds that of the stud and the parent metal.

Some typical uses of stud welding are suggested and types of studs available are shown here. Whether or not your needs are illustrated, think in terms of stud welding. Investigate what it can do for you. Get the complete story of KSM engineered benefits. Write KSM Products, Inc., Merchantville 8, N.J.



KSM
STUD WELDING

—Technical Briefs—

TOOLING:

Carbide tooling gives old machines new life.

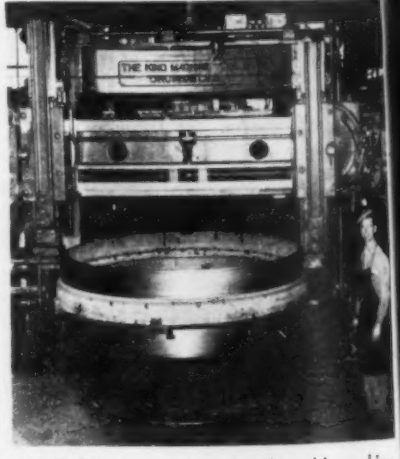
Today's modern machine tools have all the speed, power and rigidity necessary to make the most economical use of tungsten-carbide tooling. Satisfactory results are also obtained on old equipment in good operating condition.

With some ingenuity and Kennametal sintered tungsten carbide tooling, United Concrete Pipe Co., Baldwin Park, Calif., recently restored an old 72-in. belt-driven boring mill used for machining 84-in. diameter cast iron pipe joints made of a special iron to resist sewer gas corrosion. The operation consists of rough and finish profiling, facing, and boring at 89 sfpm.

Profiler Improvised

Of particular interest is the profiling done with a standard triangular insert carbide tool actuated by an improvised tracer attachment. The tool is held in a sliding tool block on the left tool ram. At the back of the tool block, a cam follower which maintains contact with a template permits the tool to cut the required profile on the pipe joint's side.

Feed rate for the rough profile cut is 0.031 in. with 0.020 in. for the finish cut. Maximum depth of cut is 3/16 in. on roughing and 1/16 in. on finishing. On that portion of the profile where stock



NEW LIFE was given to this old machine by carbide tooling. This 72-in. belt-driven boring mill machines 84-in. cast iron pipe joints at 89 sfpm.

exceeds 3/16 in. a second roughing pass is taken. Drive-belt slippage prevents use of higher speeds and feeds.

Production Boosted

Tool life on the profiling operation is three to four pieces per cutting point. With three new cutting edges available on each end of the triangular carbide insert, 18 to 24 rings are profiled before the insert requires any regrinding.

Before profiling, a standard brazed tool was used to rough-turn excessive stock from the ring's outside diameter. This tool is run at the same speed and feed as the profiling tool but depth of cut varies from zero to ½ in. due to runout of the rough casting. One to two rings are rough turned per grind.

Boring the inside diameter and facing of the ring's top is done with a standard clamped tool at 0.031-in. feed and up to ½-in. depth of cut. Tool life on this operation is three to four pieces.

After the inserts become too short for effective clamping they are used as tips for the carbide tool used for rough turning.

RADIOGRAPHY:

Big 3¼ x 10 ft film compares old and new rifles.

One of the largest radiographs ever produced on a single film, 3¼ by 10 ft, was shown recently by Allis-Chalmers Mfg. Co. in its both at the National Metal Congress and Exposition, Cleveland.

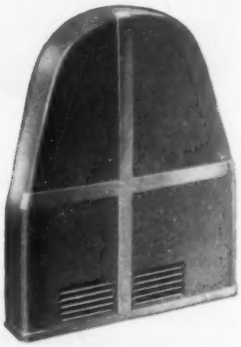
The giant magnification of two

OLD AND NEW models of Winchester rifles are compared in this 3¼ x 10 ft radiograph made using an Allis-Chalmers 22 mev betatron.

Turn Page

SHEET METAL FABRICATION

by KIRK AND BLUM



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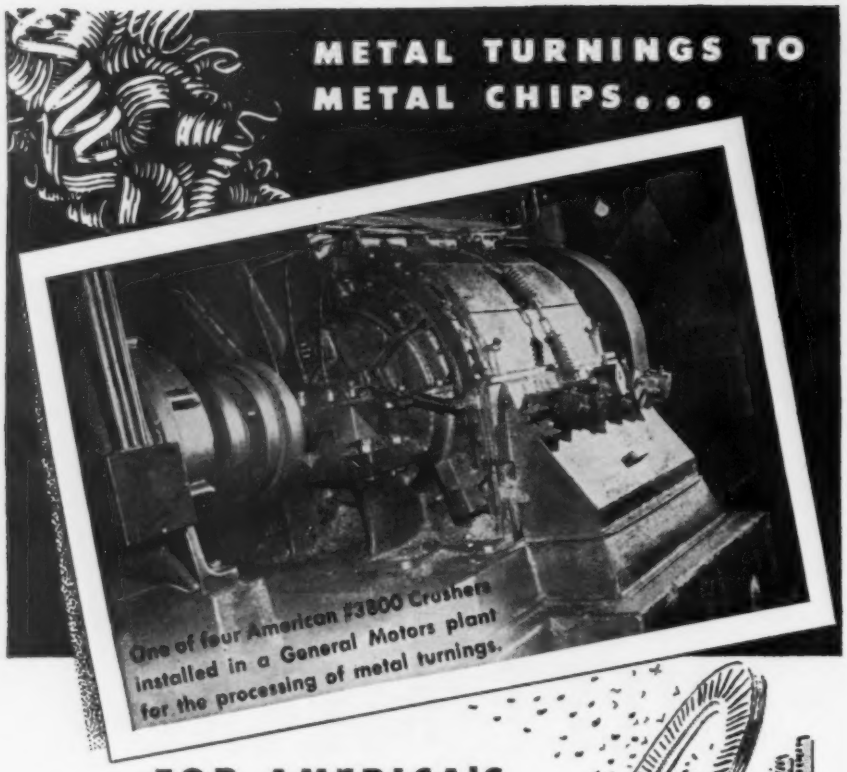
ASK FOR BOOKLET: "SHEET METAL ASSEMBLIES" 40-Page booklet shows typical examples of Kirk & Blum fabrication for jobs ranging from one unit to thousands.

KIRK AND BLUM
METAL FABRICATION


METAL TURNINGS TO
METAL CHIPS...
One of four American #3800 Crushers installed in a General Motors plant for the processing of metal turnings.

...FOR AMERICA'S BLUE CHIP COMPANIES with

American METAL TURNINGS Crushers

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These cost-conscious companies have long-since learned that American-crushed metal turnings quickly recover an initial American Crusher investment in these important ways:

$3 to $4 Extra Profit Per Ton: With higher scrap values for metal chips over ordinary machine shop turnings, a daily crushing capacity of only 2 tons will produce *$1200.00 per year in extra profits.*

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PROMINENT AMERICAN CRUSHER USERS

The users of American Metal Turnings Crushers read like a "Who's Who" of American Industry. Included are such names as:

GENERAL MOTORS • FORD TIMKEN • ALLIS-CHALMERS GENERAL ELECTRIC • BUDD WHEEL • CHRYSLER.

Write for Bulletin "METAL TURNINGS CRUSHERS"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1439 MACKLIND AVE.
ST. LOUIS 10, MO.

Winchester rifles—an old buffalo weapon and a modern piece—was accomplished with an Allis-Chalmers 22 mev betatron by using a "magna scanning" technique.

Shows Flaws to 0.001 In.

Magnification of the rifles was accomplished by direct geometrical enlargement with the film placed 8 ft from the specimen. The target to specimen distance was 4 ft and the target to film distance 12 ft, giving a magnification factor of three. The scanning arc traversed was about 40° which resulted in the center of the X-ray beam being swept across the full length of the specimen.

This technique when employed in industrial radiography has been successful in revealing details of flaws down to 0.001 in. A fine focal point and minimum secondary scattering are absolute necessities in this operation.

Betatron Rotates

The scanning technique used in producing this radiograph is similar to the old panorama pictures in that the betatron is rotated during the exposure just as the camera was rotated while the lens was open. In this operation the focal spot must remain effectively fixed in space while the betatron rotates with only the direction of the emitted X-ray beam changing.

Industrially this method is best applied to repetitive jobs which justify technique development. Eastman Kodak Co.'s industrial type film was used and was processed in tanks 4 in. wide, 4 ft high and 10 ft long each holding 90 gal of standard chemicals.

VACUUM METALLIZING:

Smaller equipment may open way for wider use of method.

Development of new, smaller vacuum metallizing equipment may open the way for wider application of this method in industry. Estimates have indicated that many small parts which are now electroplated could also be successfully vacuum metallized.

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xtra dependable industrial motors

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ELECTRO DYNAMIC

DIVISION OF GENERAL DYNAMICS CORPORATION

BAYONNE, NEW JERSEY

Technical Briefs

High Vacuum Equipment Corp., Hingham, Mass., recently developed a new 30-in. vacuum metallizing unit which provides an efficient, economical scaled-down version of larger equipment. The small equipment can operate on rapid cycles.

How It Works

With the vacuum metallizing process an initial coating of lacquer is applied to the surface of the object to be finished just as it comes from the mold. Then a very thin film of evaporated aluminum is added to this with a final coating of clear lacquer to give durability to the mirror-like aluminum finish.

This top coat of lacquer can then be dipped into a water-soluble transparent dye with a resulting brilliant, rich-looking gold, bronze, brass, silver or gold metallic finish.

Savings in finishing costs are possible because the initial coating of lacquer applied by either spraying or dipping eliminates the need for polishing operations normally required for plated parts.

Provides Durable Finish

The high vacuum finish is extremely durable and is used for objects which are subject to continual use, such as drawer pulls, toy pistols, lamp parts, etc.

High Vacuum has also built a 66-in. unit to handle large objects which formerly have been uneconomical to metallize because of their size.

SAVINGS in finishing costs are possible with many parts through use of the vacuum metalizing method. This 66-in. unit will handle fairly large parts.

Turn Page

Ready-Power offers 4 important advantages

OVER ALL OTHER GAS-ELECTRIC DRIVES

1—ONLY READY-POWER UNITS ARE INTERCHANGEABLE thus permitting maintenance of power units without costly truck downtime.

2—READY-POWER UNITS ARE THE ORIGINAL GAS-ELECTRIC DRIVE. Today they are backed by more than 25 years of know-how and experience.

3—ONLY READY-POWER OFFERS DIESEL-ELECTRIC POWER. Records show that trucks equipped with Diesel-electric operate at the lowest known costs per ton-mile.

4—ONLY READY-POWER OFFERS A FULL RANGE of gas-electric and Diesel-electric power units to match the exact requirements of ALL makes of electric trucks.

Remember . . . your truck is no better than its power. It PAYS to convert present electric trucks to Ready-Power . . . and it PAYS to specify Ready-Power when buying new trucks.

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Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

—**Technical Briefs**—

PAINT BASES:

New measuring method will aid control of base solubility.

An improved method of measuring chemical conversions which take place in pretreatments that are used as paint bases for steel surfaces has been devised in the Research Division of New York University's College of Engineering.

The new system is expected to aid greatly in assuring production control by controlling the solubility of paint bases, according to Dr. Max Kronstein, who supervises surface technology research. The organic coating applied over the base will become more durable if the chemical pretreatment base can be made as insoluble as possible. In practice pretreatments are applied from water solutions for a contact time of about one to two minutes.

Provides Control Method

Experiments point to a convenient and practical control method in pretreating of steel surfaces with metal-phosphate coatings. Applying the phosphate coatings before the paint appreciably increases the bonding characteristics between paint and steel.

The new method consists of measuring—through loss of electrical resistance—the transfer of water-soluble matter from the pretreated surface. The NYU research workers immersed treated steel panels in distilled water whose resistance they previously measured.

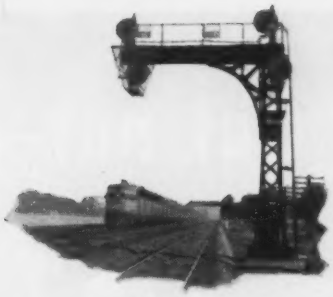
Measurements were taken as frequently as possible during test periods of up to two minutes, since most of the unconverted chemicals quickly dissolve in water.

Coating Life vs. Pretreatment

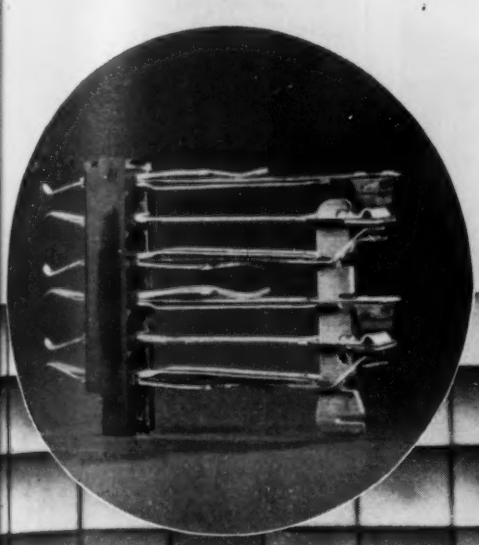
Next, organic coatings were applied to chemically pretreated bases of various solubilities. Under salt-fog exposure, life of coatings was found to be closely related to the success of the pretreatment conversion before paint application. In each case, the

Turn to Page 192

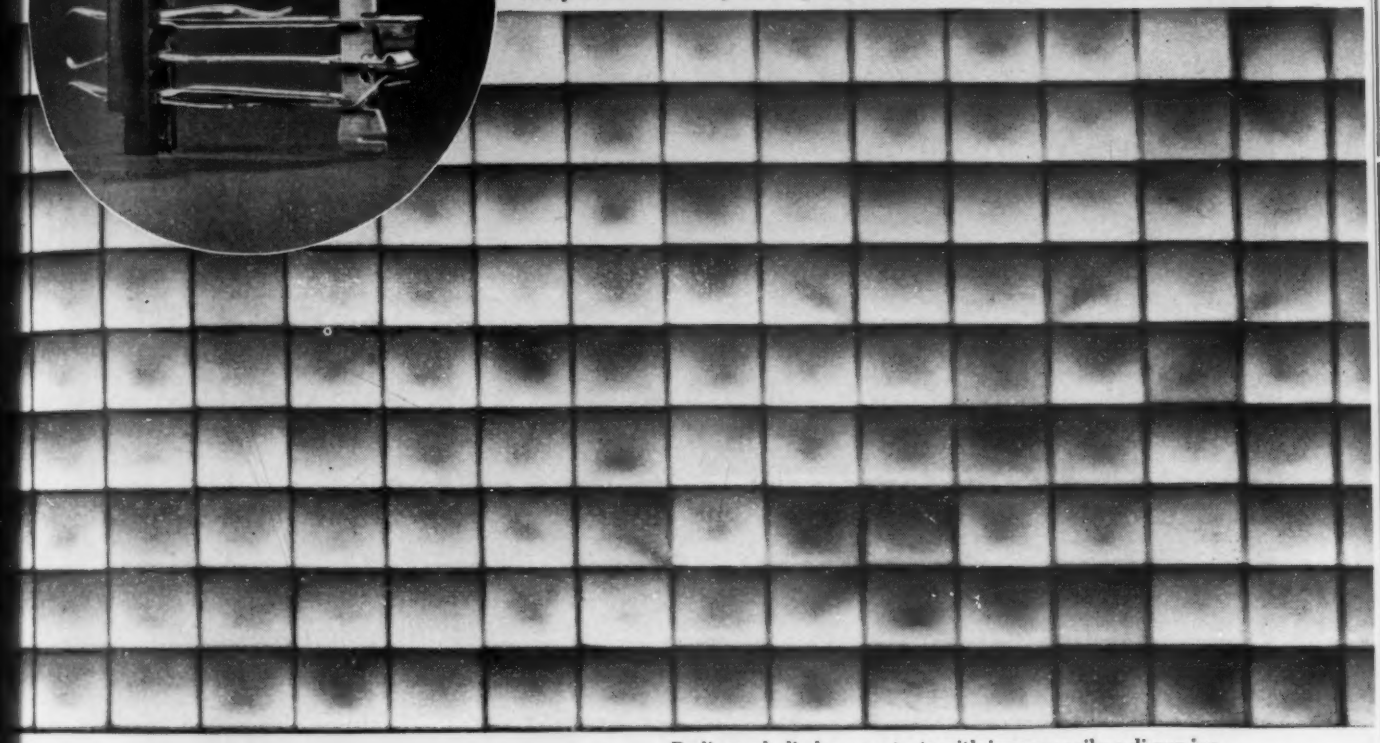
These relay contacts



spell train safety—



Relay contact assembly showing silver-carbon contacts.



Radiograph discloses contacts with improper silver dispersion.

RADIOGRAPHY gives them the "Green Light"

RELAY CONTACTS for railway signals must have low resistance. Ideally, this would call for silver touching silver—but pure silver contacts might fuse if overloaded and the signal lock on green. Carbon contacts can avoid this but have too high resistance.

The answer lies in impregnating carbon with silver, then making sure by radiography that the silver grains are properly dispersed throughout the carbon. This provides assurance that the relay will have a non-fusing contact with low resistance.

It's another example of how radiography can prove internal soundness, whether in such a compound as this, in a casting, or a weld.

Radiography is improving products and production in many kinds of operations. To learn how it can help you, see your x-ray dealer.

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SNAP-ON TOOLS CORPORATION
8132-K 28th Ave., Kenosha, Wis.

*Snap-on is the trademark of Snap-on Tools Corporation.

coatings were produced from the same paint, were applied in the same thickness, and dried under the same conditions.

NYU's paint research laboratories developed the electrographic printing method several years ago for similar tests in a number of coating problems. This system records moisture penetration or the underfilm spread of moisture in organic coatings. It produces permanent records of each phase in testing.

SHELTER:

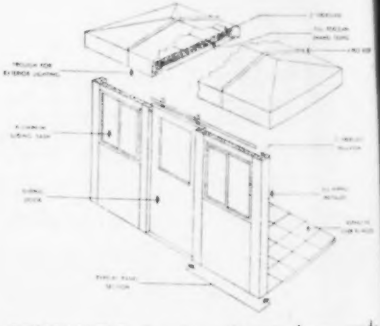
Porcelain enameled steel gate-house prefabricated.

An unusual porcelain enameled steel building developed by Erie Enameling Co. can be shipped completely assembled from the factory and placed on a customer's foundation in about 3 hours.

The new building, which measures about 4 x 11 ft, is designed to serve as a gate or guard house at industrial plant entrances, a scale house, yard office or any number of plant applications where personnel must be sheltered in all types of weather.

Design is such that it can be fully assembled and shipped by truck, ready to be lowered onto a prepared foundation. Or, the unit may be factory-assembled in complete panel sections which are shipped crated and rapidly erected on the site by shop maintenance crews.

The house provides every convenience needed for the proper shelter of personnel. Building



SCHEMATIC drawing of gate house made of porcelain enamel steel. House is prefabricated and may be obtained already assembled or knocked down ready for assembly on foundation.

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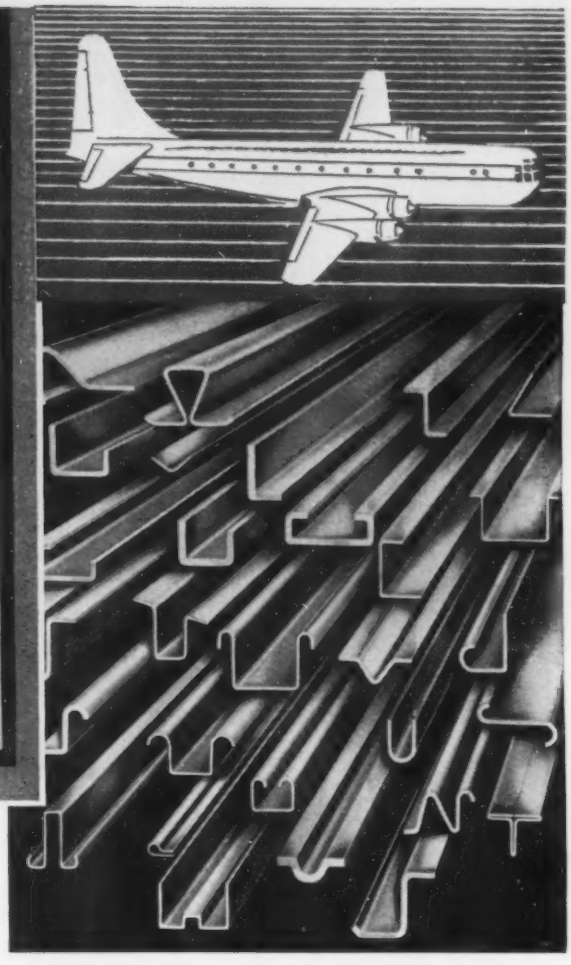

▲ Cold Roll Formed Structurals used universally for airplane framework.

Casement window made from cold roll formed shapes by Copco, Detroit. ▶

MULTI-FUNCTION SHAPES

• Coiled strip may be economically converted into plain angles, channels and other structurals up to ½" thick, in a Yoder Cold Roll Forming Machine. For most purposes, however, special designed shapes are preferred, combining the structural with other functions, to obtain more attractive appearance, greater strength, lighter weight, quicker, easier fabrication and assembly. The saving thus effected often amounts to many times more than the entire conversion cost.

In making the body and wings for airplanes, special designed cold roll formed structurals are indispensable because of high strength-weight ratio and other advantages. In automobiles, trucks; electric appliances; doors, windows, studs, joists, trusses and other building components, Yoder cold roll forming machines have contributed importantly to the tremendous strides made towards stronger, lighter, finer products at lower cost.

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2319 S. Concord Road Lafayette, Indiana

sidewalls are made of porcelain enameled steel "sandwich" panels.

Panels Insulated

These are insulated and finished on both sides so that the building is completed inside and out as each panel goes into place. The porcelain enameled roof is also insulated and provided with a porcelain enameled ceiling as interior finish.

Sliding aluminum sash on all sides provide plenty of light and ventilation. A sliding metal door is also used to conserve space, and an extra door can be provided to allow entry or exit from both sides of the building.

Wiring, Lighting Included

Interior lighting and all wiring is furnished installed. Provisions are also made for fluorescent trough lighting in an exterior eave trough and for roof top flood lights.

The floor is finished with asphalt tile or linoleum. Metal desks and pull-down wall stools are available. Electric outlets are provided for radiant heaters or fans.

The entire structure is rigid-panel construction. Gross weight is approximately 1700 lb.

METALLURGY:

Wide research spurs interest in rare earths for steel, iron.

Rare earths have in the past decade rapidly gained a place of importance in the steel industry. Modern metallurgical developments have given the group a new importance in the metals industry. Development of increasing acceptance of the rare earths by industry has been recently outlined by Molybdenum Corp. of America, Pittsburgh.

The group consists of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, thulium, europium, gadolinium, terbium, dysprosium, holmium, Erbium, ytterbium, lutecium.

Yttrium is often classed as one of the rare earths but strictly speaking it is not.

Use of thorium in the mantles of incandescent gas lights brought attention to the rare earths. As

the thorium use decreased due to the supplanting of gas mantles by electric lamps, interest in the rare earths correspondingly decreased.

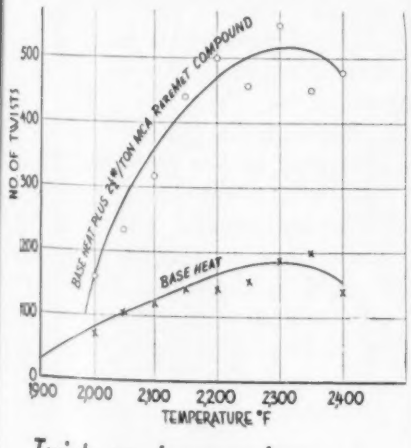
Prior to World War I, the pyrophoric properties of the rare metals were used for lighter flints and fuses in explosives. Despite this and the sporadic discovery of new uses, such as in optical glass and polishing compounds, the rare earth industry remained relatively undeveloped.

Production Complex

The world's known supply of rare earths was in India, Brazil, and to a small extent in the rutile sands of the United States. They usually were associated with calcite, silica, barite, titanium, oxide, and some alumina. Efficient production of concentrates from ore is not a simple problem. Making the chemicals and the metals has likewise been complex.

Misch metal, the mixture of all the rare earth metals in the metallic form has been mentioned for more than 50 years. Production for pyrophoric alloys, such as flints for cigar lighters, has also been going on for many years.

During World War II, airplane steels had very severe requirements on visible nonmetallic inclusions. Harold Phelps developed the use of rare earth fluorides for reducing occluded Al_2O_3 in molten steel. He made many tons of steel using rare earth fluorides. Successful trials are also reported in high aluminum steel, such as Al-Ni-Co magnet and nitriding steels.



Twists vs. temperature . . .

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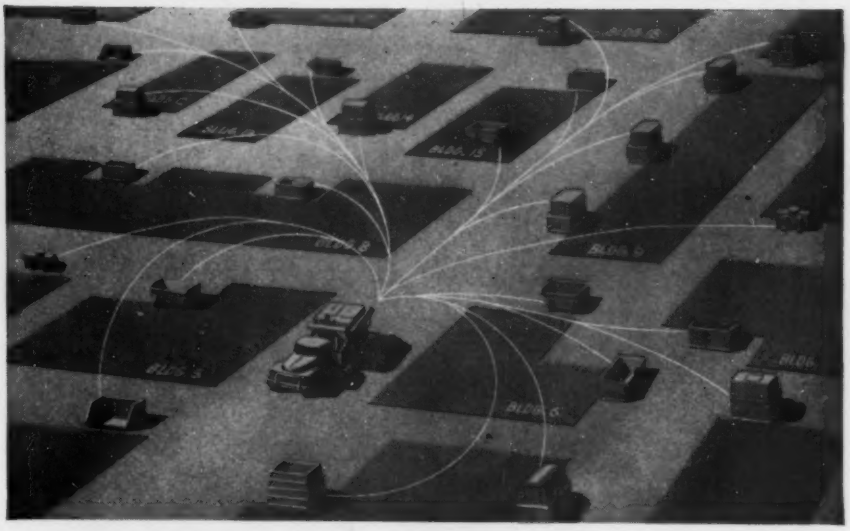
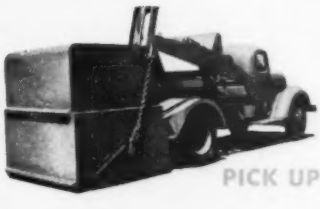


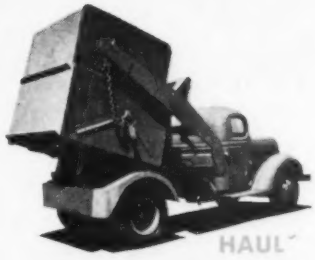
What you can do about your high cost of bulk Materials Handling

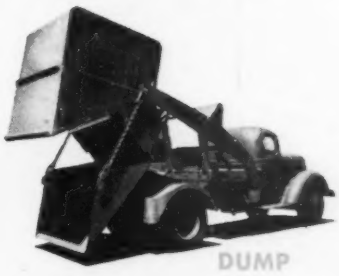
The picture above tells the whole story of the Dempster-Dumpster System of Bulk Materials Handling. Never before have you been able to cut bulk materials handling costs so drastically! One truck-mounted Dempster-Dumpster handles the entire group of Dempster-Dumpster Detachable Containers. It's like having scores of truck bodies for a single truck.

Containers are spotted at convenient materials accumulation points. When loaded each is picked up, hauled and emptied (as shown at left) . . . or load set down intact. Entire operation is handled by only one man, the driver, by hydraulic controls in cab.

Each container is designed and built in the desired size up to 12 cu. yds. to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. You can handle, at tremendous savings, materials of many descriptions—trash and waste materials, raw materials, finished products, etc.—with only one truck and only one man, the driver. Write to us for complete facts. Manufactured exclusively by Dempster Brothers, Inc.







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—Technical Briefs—

When the atomic bomb was developed, thorium was found fissionable. India and Brazil stopped the export of rare earths minerals since they contained thorium. This left the supply of material for lighter flints very precarious.

A search for rare earths in the United States lead to a source in California of a deposit of bastnasite ore, a carbonate of the rare earths. This large deposit was developed by the Molybdenum Corp. of America.

Use for Steel Justified

The first use of rare earths in the steel industry in the United States was in the form of misch metal added to steels which were difficult to roll. These were usually the high-priced stainless and heat-resisting varieties.

Some varieties had to be pressed initially (not bloomed) to smaller sizes because they hot-worked poorly, were surface-prepared and then rolled to other sizes. Smaller ingots were used to reduce hot working so that costs were high. It is here that rare earths first justified their use by reducing costs.

Improve Hot Workability

Difficulty in rolling seemed to stem from several factors: (1) a coarse columnar structure, (2) off balance analysis causing excess ferrite at rolling temperatures which tends to resist hot deformation, (3) heavy inclusions such as those caused by the addition of titanium to stainless steel.

In assisting these several important factors, hot rolling of highly-alloyed steels has been improved through the use of rare earths.

Rare earths tend to act as a nucleator to the primary crystal to break up the coarse columnar structure usually found in the ingot stage of stainless steel production. As an aid in helping the off-chemical balanced steels and in fluxing the nonmetallics, both shape and distribution-wise, the rare earths increase the hot-workability of these highly-alloyed steels.

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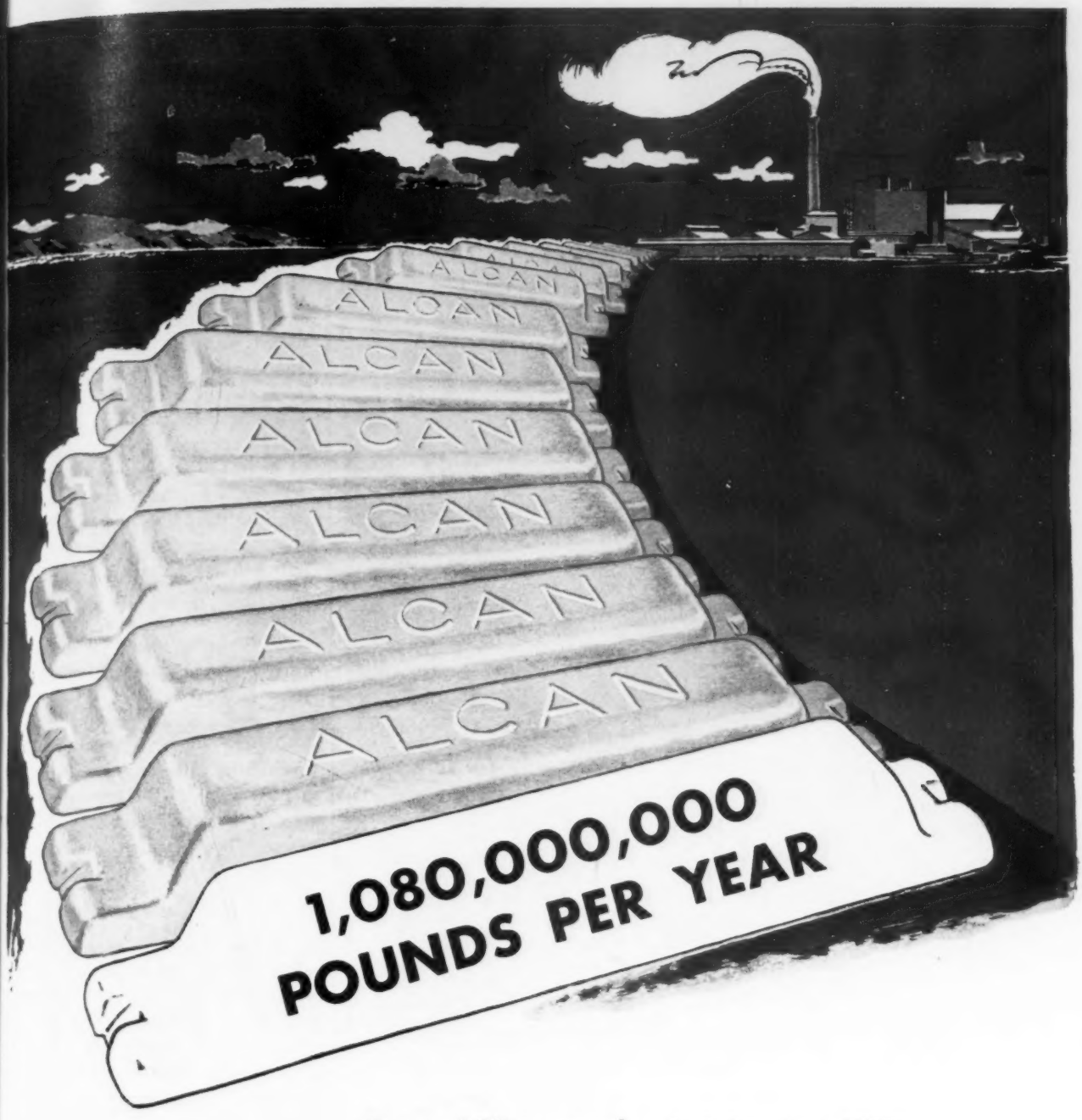

Over a billion pounds – that's the estimated 1953 production of the Aluminum Company of Canada, Ltd. ("Alcan"). Next year's total: one billion pounds *plus* the initial output of Alcan's great new Kitimat plant. This plant, by itself, will eventually *double* Alcan's productive capacity. With additional ingot soon available, perhaps we can help you plan ahead. We are the sole distributor for Alcan aluminum in the United States. If there is any information you need, our nearest office will be pleased to help.

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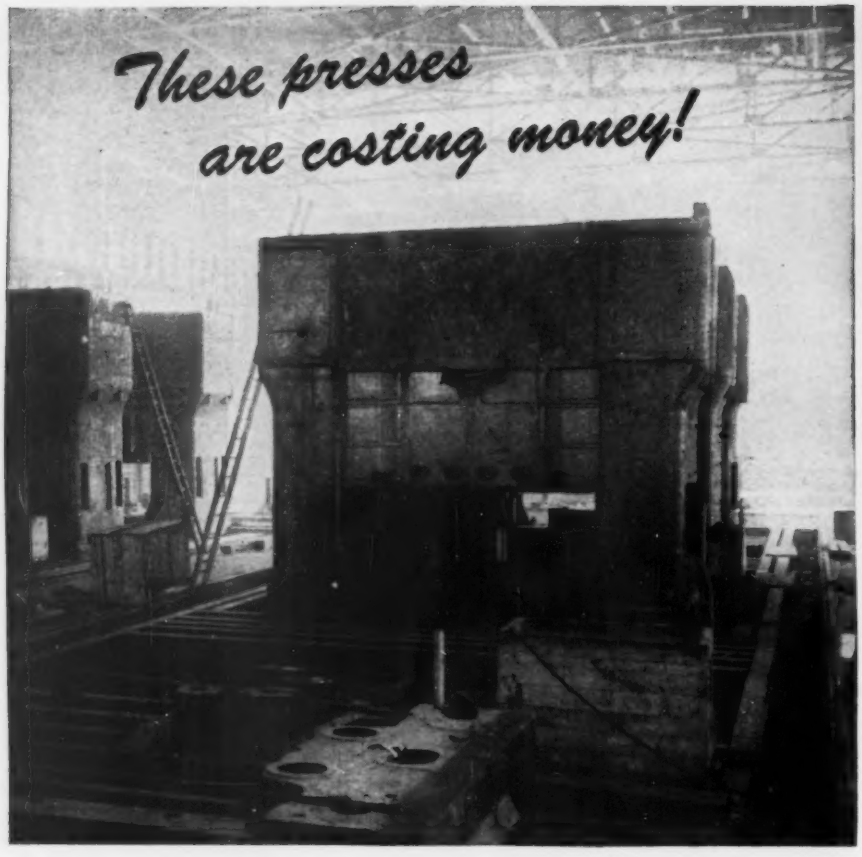

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—Technical Briefs—

Molybdenum Corp. made their first heats by placing misch metal on the ladle bottom then adding 2 to 3 lb of calcium silicon per ton on top of it. The heat was then poured and any other necessary additions were made as the ladle filled.

Crystal Size Reduced

Six to 8 lb per ton of misch metal was the first addition and one of the first steels so treated was 310 stainless.

Large reductions in coarse columnar crystals obtained provide at least a partial explanation of why rare earths help the hot rolling quality of stainless steel.

With improved hot workability using misch metal, it was possible to effect a sulfur reduction in many cases. A few steel plant metallurgists hoped to obtain the same results by lowering the sulfur content through other means. The great improvement achieved by using rare earths is difficult to equal, and it is believed that unless a reduction of the crystal size as-cast is obtained, not much aid for rolling by the drop in sulfur is found.

Seek Cheaper Forms

Although misch metal permitted steels to be cast in large mold size and then rolled, patches of nonmetallics, sometimes as big as 10-cent pieces, were noticed when deep etch tested. Examination showed these areas to be rare earth sulfides mixed with manganese and iron as oxides or sulfides.

As more heats were made, a cheaper and more accessible form of rare earths was sought. Introduction of what was then called T-Compound was the first stage in this development. Now, Molybdenum Corp. has added various forms of rare earths to their line known as RareMeT products.

Helps Cut Costs

RareMeT Compound is an intimate mixture of rare earth oxides, a reducing agent and an energizer. It overcomes objections to misch metal in many ways. Rejections previously made because of poor

etch tests caused by rare earths added as misch metal have been practically eliminated.

The effect on hot working quality is still standard. Furthermore, the cost of using this newly developed product was much less than the cost of using misch metal.

Some time ago, manufacturers of acid had difficulties in using rare earths. When either misch metal or RareMeT Compound was added very little improvement in properties was noted. Investigation showed that acid radicals and rare earths were not compatible.

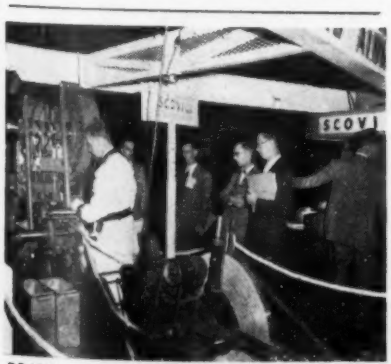
A new RareMeT Compound was developed for use in acid steels or those steels which had acid radicals. A basic material, intimately mixed in the compound, supplies basicity at the point where the reaction takes place.

Claims Substantiated

Many claims have been made for rare earths in wrought and cast steels. Such claims as sulfur elimination, better fluidity, improvement in impact strength at both low and room temperatures and other rumors were quite common during 1950 and 1952. Today, these claims are largely substantiated.

Hot-workability has proven itself as one good reason for adding rare earths to wrought steels. Better impact at varying temperatures has been corroborated by several steel plants, along with sulfur eliminations in many instances.

The effect of rare earths on molten steel is positive. Changing the primary crystals, changing the

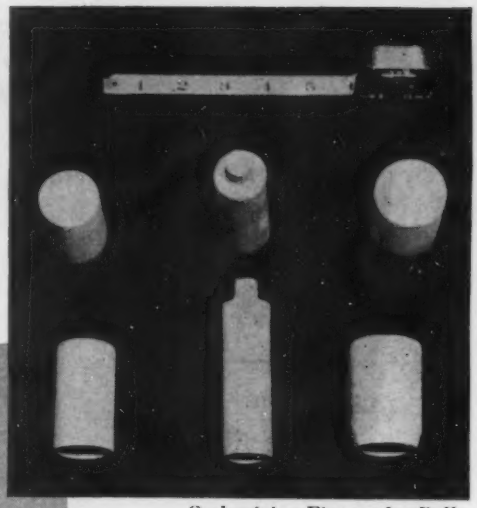


DRAWING QUALITIES of cold-rolled aluminum and brass were compared in this demonstration set up by Scovill Mfg. Co., Waterbury, Conn., at the National Metal Exposition, Cleveland, recently.

Turn Page

Small

HIGH ALLOY CASTINGS

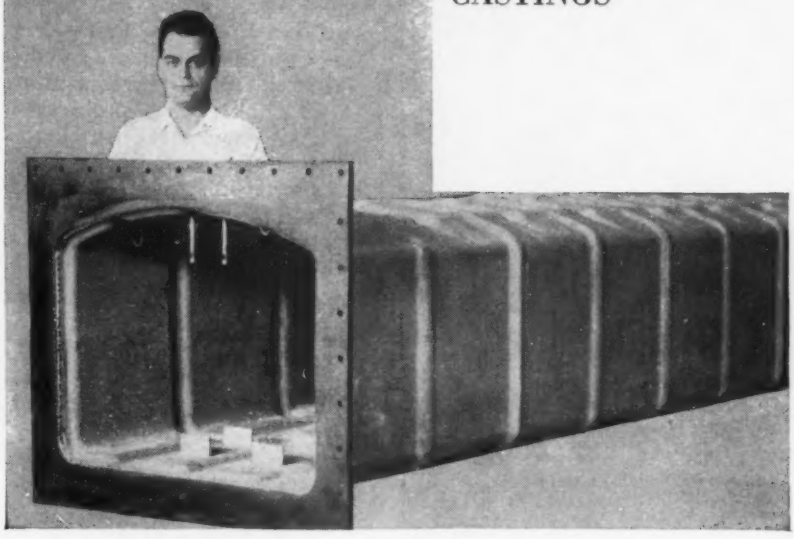


Carburizing Fixture for Ball Bearings 1½" diameter—Analysis 35% Ni — 15% Cr

DURALOY

Large

HIGH ALLOY CASTINGS



Muffle for Continuous Strip Annealing 12' 6" long — Analysis 38% Ni — 18% Cr.

LARGE or small DURALOY, can do it! These are just typical examples of the work moving through our foundry. Some of these castings are designed for heat resistance, some for corrosion resistance, some for abrasion resistance; all are cast by experienced foundrymen. All are carefully tested in our up-to-date laboratory.

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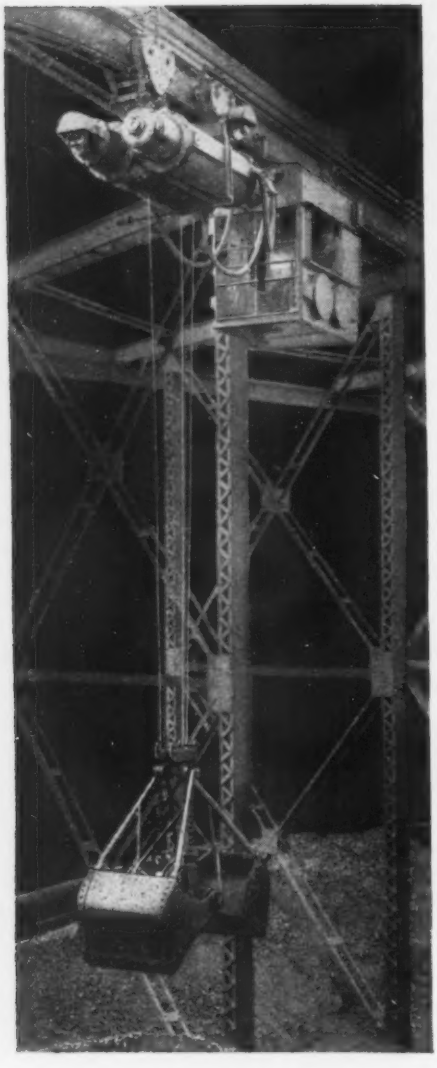

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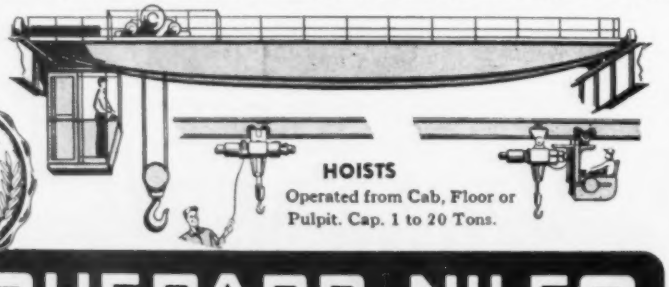

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type of inclusions, reducing both sulfur and gases may all be a part of the mechanism which gives the final effect of rare earths in steel.

Stainless Difficulties Overcome

Stainless steels were the first to use rare earths. Because of their heavy alloy content, sensitivity to inclusions, formation of phases which do not hot-work well, general resistance to deformation and response to entrapped gases, certain types of stainless steels are difficult to roll. Their costs are high and any method to reduce surface preparation or rolling operations is valuable.

Today, the small addition of a RareMeT Compound makes stainless steel easier to hot roll, cleaner, yields have increased and costs have been reduced.

Precautions Must Be Taken

Melting practice varies little among stainless steels using rare earths. The rare earths addition has usually been the last or next to the last additive and the deoxidizers have both preceded them, and been added concurrently.

No matter what type steel is being melted some general precautions should be observed. (1) Tapping temperatures should be as low as possible. (2) Slag should be held back if at all possible so as not to lose the rare earth effect. (3) The rare earths should be added as close to the base of the tapping stream as possible. This will insure better mixing and lessen the chance of losing the rare earths to the slag or turbulent air above the rising ladle metal.

There has been experimental work on the 8100, 94B00, 8600 and 4300 SAE steels. To date the major improvement found in these steels has been transverse impact strength plus hot workability.

Some study has also been made of the possible partial substitution of manganese in wrought steels. Partial results obtained in identical steels with and without the use of rare earths insofar as hot ductility is concerned have been evaluated on a basis of cost.

Economics do not currently favor substitution of manganese with rare earths but if in time of war or through development work a lower priced rare earths addition is produced, the economics of the problem could change rapidly and favorably.

Use In Cast Iron

The use of rare earths in production of iron has been for a somewhat different purpose. About the same time researchers were attempting to change the graphite flake in ordinary gray iron to a nodular formation with the use of magnesium, Henton Morrogh, working with the British Cast Iron Research Assn., was developing the use of misch metal for this same purpose.

He was quite successful in his work. However, when considering the economic difference between magnesium and misch metal, the price for misch metal is too high for competition. Also, the magnesium treatment was successful in both hypoeutectic and hypereutectic iron, whereas misch metal seemed only to form the spheroidal graphite in hypereutectic irons.

Tried On Ductile Iron

Since Morrogh presented his original paper in 1948 on production of ductile iron through the use of misch metal, he has been developing the use of rare earths in nodular iron but for a different purpose.

There are certain trace elements, Pb, Ti, Cu, As, etc., which might be picked up during the production of ductile iron either by poor scrap or contaminated pig iron.

These elements tend to promote flake graphite and if present in excess amounts, will destroy the nodular formation of the graphite completely. Mr. Morrogh, at the Foundryman's Convention in Atlantic City, May 1952, presented a paper which showed that by the use of a small amount of misch metal, preferably after the magnesium treatment of the iron, physical properties of totally nodular

Turn Page

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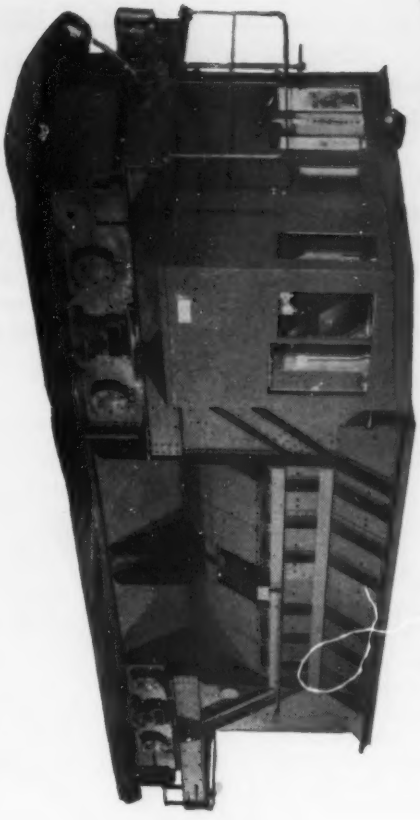

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iron were attained even though these tramp elements were present in excessive amounts.

Molybdenum Corp. has endeavored to carry this investigation further by attempting to treat the iron with small amounts of rare earth compounds rather than the very expensive form of misch metal.

Practice Changed

Standard practice has been changed considerably over previous production work. In conjunction with Air Reduction Co., Inc., and one of the leading ductile iron manufacturers, use of rare earth compounds, along with magnesium oxide combined with calcium carbide which acts as the desulfurizer through a gun using inert nitrogen gas as the forcing media, has been introduced.

The economics of the problem seem to be very much in favor of this new method of production, plus the added fact that there is insurance of producing a nodular iron even though there are contaminating elements present.

Some of the earlier work which was reported on rare earths in steel castings was that done by C. D. Berry, vice president, Hartford Electric Steel Co. His conclusions showed an increase in impact strength both at room and low temperatures through the use of 2½ lb of misch metal per ton after 4 lb of aluminum per ton were added.

Rare Earths In Cast Steel

His explanation of why he obtained these improved physical properties is quoted below from a recent article published in American Foundryman and written by Berry:

"Since eutectic sulfide inclusions, the cause of low ductility, are found along the primary grain boundaries, it can be assumed that they are the last phase to solidify. Raising the freezing temperature of sulfide inclusions precipitates

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TYPICAL PART made on Hydroform press is shown by Roland Teiner of Roland Teiner Co., Inc., Everett, Mass., to John E. King, chairman, Pressed Metals Institute. Occasion was the first Fall meeting of the Institute. Hydroform process was developed by Cincinnati Milling Machine Co., Cincinnati.

them earlier during solidification. Thus, they are randomly distributed since precipitation is complete."

Study of Impact Values

In recent work steels of an alloy composition which require high impact values at low temperature have received considerable attention, and G. A. Lillieqvist of the American Steel Foundries has given considerable study to the effects of addition of rare earth elements to some of the cast steels.

Present work has paralleled much of the data presented by Mr. Lillieqvist and corroborates the effect of increased fluidity, the value of increased low temperature impact values, the reduction of sulfur in several heats, the change in the type of the inclusions, and we have some evidence which indicates that hot tearing is reduced by its use.

Use In Carbon Steels

A quick resume of carbon steels as shown by Lillieqvist in his paper is quite significant. Undoubtedly the use of rare earth material in steel castings will be a definite help in meeting some of the more rigid specifications in the future.

To date, no improvement in tensile and yield point, temper brittleness or hardenability with the use of the rare earths has been observed; but, increased fluidity, sulfur reduction, and the effect on the size and shape of the inclusions have all been improved. The principal value in cast steels for the use of rare earths has been increasing the impact values, both at room temperature and low temperature.

Rare Earths vs. Strategic Alloys

Since many steel castings must function in low temperatures such as the frozen north country of Canada, in the Arctic or Antarctic regions, the value of increased low temperature impact figures are most important.

Also, in time of war, impact at both room and low temperature is

Turn Page

Efficient Stripping of Rejected Painted Parts

When the volume of painting rejects slows your rate of production—as may occur in the manufacture of rigorously-inspected defense equipment—it is time to plan an efficient method for stripping the faulty coatings.

The rejected parts represent a considerable investment in the cost of metal and the cost of fabrication. To hide 5% of your total production in a corner is like hiding 5% of your working capital in a sock. The quicker you reclaim those rejects and push them through as accepted parts, the better profit you make on your contract.

Sometimes the time element dictates more efficient stripping. Suppose a sub-contractor undertakes to produce 100,000 parts in 20 days. Suppose he averages 5% rejects and lets them pile up until he has 5,000 to strip and re-process on the 20th day.

On that day he discovers with sorrow that it is a lot harder to strip and repaint 5,000 rejected parts than it was to paint his regular daily quota of 5,000 new parts. He misses his deadline and suffers embarrassment that could have been avoided by stripping 250 rejects each day for 20 days instead of 5,000 in one day.

Furthermore, it usually is much easier to strip the parts on the day they are rejected. Even though the parts were thoroughly baked in the ovens, it is still true that the longer the paint ages on the metal the harder it is to remove by any method of stripping.

Dumping rejects into a tank for overnight soaking is not always the best way to strip the paint. Some paints that cannot be removed by immersion in any one stripper—be it alkaline or acid or solvent—respond quite readily to a combination of two strippers.

The technique of rinsing is also important. Some paints yield only to a hot alkaline stripper followed by a hot rinse. Sometimes a cold rinse following a hot immersion seems to provide a shock that removes the paint with great speed.

The economy of finding the best stripping method is so great that it merits careful planning. It may also require the advice of a man who has had plenty of experience with all types of stripping operations. Such a man is the Oakite Technical Service Representative in your city.

At the command of the Oakite Representative are more than a dozen stripping materials that work with great speed and efficiency, whether used for reclaiming rejects from the painting line or for stripping conveyor chains, racks and hooks. Among these materials are:

1. Alkaline strippers that remove many types of paints and are also excellent for "killing" the overspray in water-wash paint booths.
2. Solvent strippers that are especially effective on the newer types of synthetic lacquers.
3. A viscous solvent stripper of special value because it adheres to vertical and inverted surfaces.
4. A solvent stripper and an alkaline stripper especially designed for safe removal of zinc chromate primer from aluminum.
5. An acidic material that strips certain organic finishes and simultaneously removes oil and rust.

For more information on this subject, phone your local Oakite Technical Service Representative or mail the coupon below.

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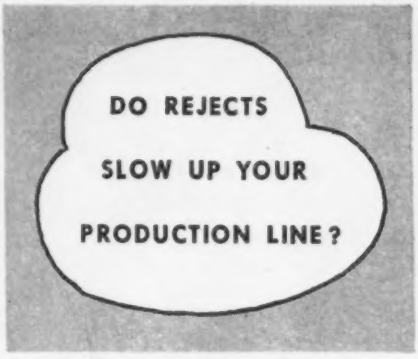

When painting rejects slow your production you may need one of the Oakite strippers described in the free booklet "How to STRIP PAINT." The booklet answers many questions that may help you work out better stripping procedures. For example:

¶ What's the cheapest way to strip metal parts in large volume? *See page 9.*

¶ What strippers are best for removing oil base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of "How to STRIP PAINT" and for advice on your particular paint-stripping problem, just send us the coupon.

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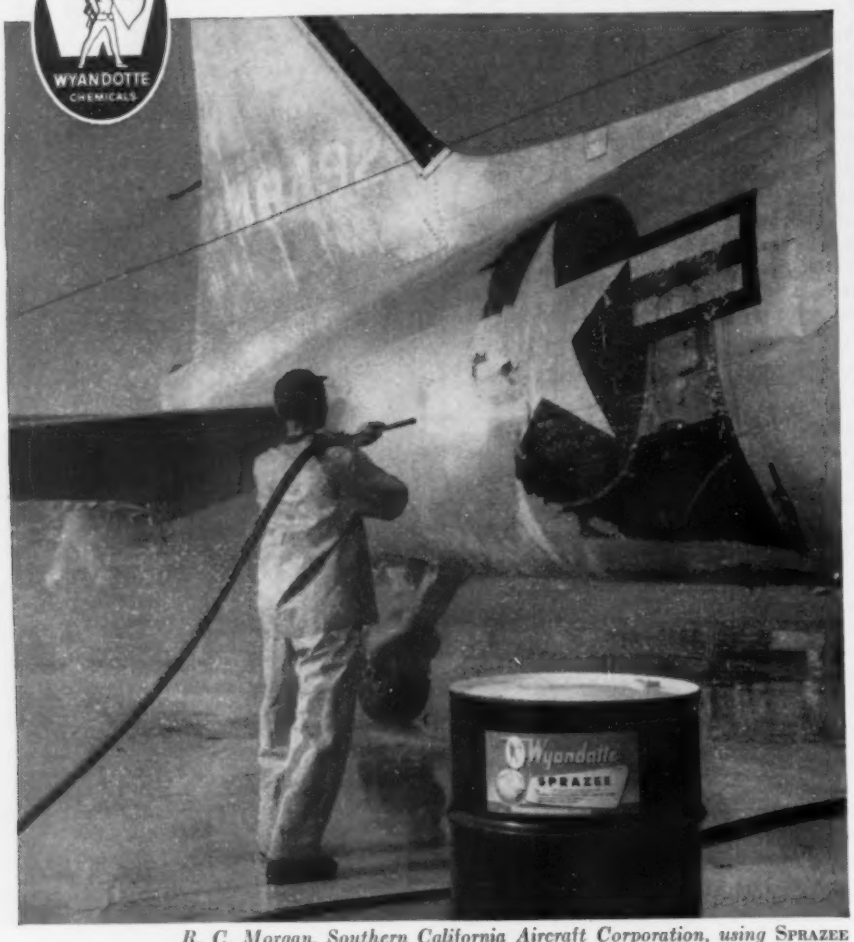

R. C. Morgan, Southern California Aircraft Corporation, using SPRAZEE *— note how* SPRAZEE *has blistered the paint — making it easy to flush off.*

Need a good paint stripper? Try Wyandotte SPRAZEE

Mr. Earl Martin, foreman, Southern California Aircraft Corporation, has this to say about Wyandotte SPRAZEE: "We have found that SPRAZEE is a fast-acting, free-rinsing paint stripper, easy to apply by spray or brush. It works very well even in cool or foggy weather, and usually one application is enough."

Wyandotte SPRAZEE is effective, easy to apply and use, economical. It meets government requirements for use on military aircraft.

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important to the various armour plates and gun tubes produced. There also is the possible substitution of strategic alloys which become scarce during international uprisings.

Partial substitutions for nickel and manganese have already been proven a possibility; only the economics of the situation are currently out of line and even then not to the extreme amount.

Present Research Status

Molybdenum Corp. has sponsored a research program at Rensselaer Polytechnic Institute to study the effect on the weldability of cast plate steel.

Results of this program point out that no detrimental effect was found with the addition of Rare-MeT Compound at a rate of 3 lb per ton of steel. In fact, at the higher heat treating temperatures an improvement in impact (in the weld metal) with no change in the other physical properties was shown.

A research study at the University of Pittsburgh to investigate the desulfurization of steel by rare earths has also been sponsored. Results are forthcoming on this project and will be summarized in a future progress report.

Other Research

Battelle Memorial Institute has recently completed some investigations for the Steel Founders Society along the same lines that the University of Pittsburgh has been working. The Society has published these results.

Industrial research with rare earths is also currently being carried on by all the major steel companies and it is expected results will be presented as soon as production experience is satisfactorily confirmed.

FINISHING:

Procedure converts polishing lathe to use abrasive belt.

Interest in finishing metallic and nonmetallic parts with abrasive belts has prompted some manufacturers to convert existing

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Conversion time should not exceed 1 hour . . .

polishing lathes for belt use. To aid in this effort, Behr-Manning Corp., Troy, N. Y., has detailed a procedure for good belt tracking and a practical range of machine flexibility.

Time for the conversion need not exceed 1 hr. Cost of the conversion materials is about $100.

Three Conversion Parts

New equipment required for conversion includes a contact wheel, a backstand idler pulley and a coated abrasive belt. Contact wheels, usually made of compressed canvas or rubber, come in a wide range of hardnesses. Hard density wheels permit a fast rate of stock removal while soft density wheels are used for producing fine finishes and contour work.

Backstand idlers are the adjustable idler wheels which maintain belt tension and control belt tracking on the contact wheel. Several types of idlers incorporate a means of adjusting and controlling belt tension and tracking from the operator's normal working position.

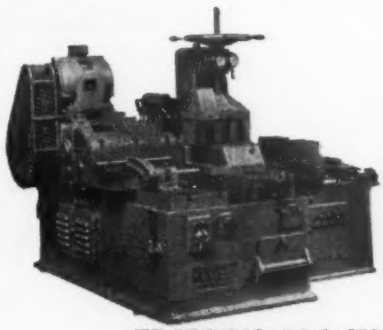
Belt Depends on Work

Belt selection depends on the results desired and the hardness of the material. For fast stock removal, coarse-grit belts are required, and for finishing, fine-grit belts. In general, 24 to 60-grit belts are recommended for rough grinding, 80 to 150-grit belts for intermediate polishing and 180 to 500-grit belts for finish polishing.

Cloth-packed belts coated with aluminum-oxide grains are preferred for metal. Belts coated with aluminum oxide or with garnet abrasives are preferred for wood sanding. A grease lubricant is necessary for polishing aluminum and other soft nonferrous metals. It will also improve finishes on steel.

Preliminary preparations for conversion include removing the old set-up wheel and checking the

Turn Page



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Use standard length belts to keep costs down . . .

spindle for excessive runout and wear. If the spindle does not run true or is worn, the contact wheel cannot run true. For best polishing results, this contact wheel must run concentric.

Calculate the center distance between the center of lathe spindle and the center of the idler pulley shaft using the formula:

$$\text{Center distance (C. D.)} = \frac{\text{belt length}}{2} - \frac{(D + d)\,\pi}{4}$$

D = diameter of the contact wheel.
d = diameter of the idler pulley.

Place the backstand idler on the floor behind the lathe in approximate alignment with the contact wheel and at calculated center distance. The belt tension adjustment on the idler unit should be adjusted to its center postion.

Belts of standard lengths should be used where possible because they cost less and are more readily available than belts of special length. Install your backstand idler pulley so you can use coated abrasive belts of the following dimensions:

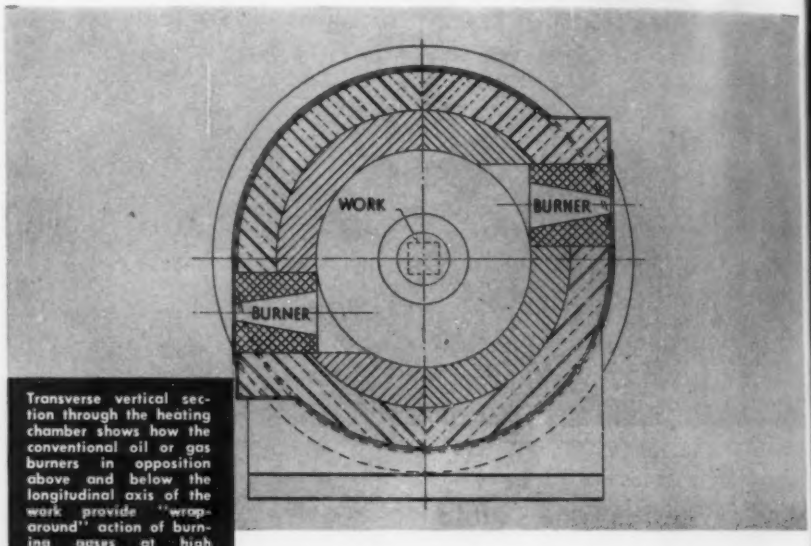
Length, in.	Width, in.
48	2½
60	2½
118	4
132	3 and 4
138	3 and 4
148	3 and 4
168	3 and 4

COATED ABRASIVE BELTS on polishing lathes and idlers take over job of finishing bumper guards prior to plating. Belts offer flexibility to existing equipment.

Run a chalk line to the outside rim of the contact wheel and extend the line across the wheel to the idler pulley. The line will contact the edges of the contact wheel and idler pulley.

After aligning the pulley and contact wheel with the taut line, mark the position of the backstand idler on the floor. When aligning the two wheels, the tracking adjustment must be placed at its center position to permit equal left and right side movement for belt tracking.

If the idler pulley is wider than the contact wheel, move the idler pulley assembly distance equal to one half the difference in their widths. With the idler set in this position, spot holes on the floor for fasteners.



Transverse vertical section through the heating chamber shows how the conventional oil or gas burners in opposition above and below the longitudinal axis of the work provide "wrap-around" action of burning gases at high velocities.

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R-S Hi-Head® Heating System prepares bars, slabs, pipe, tubing, and other forms of long, straight stock for forging or heat treatment to meet the most Rigid Standards.

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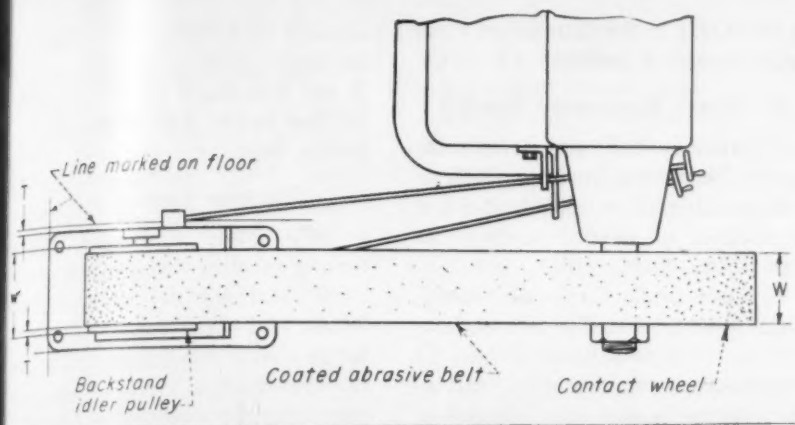
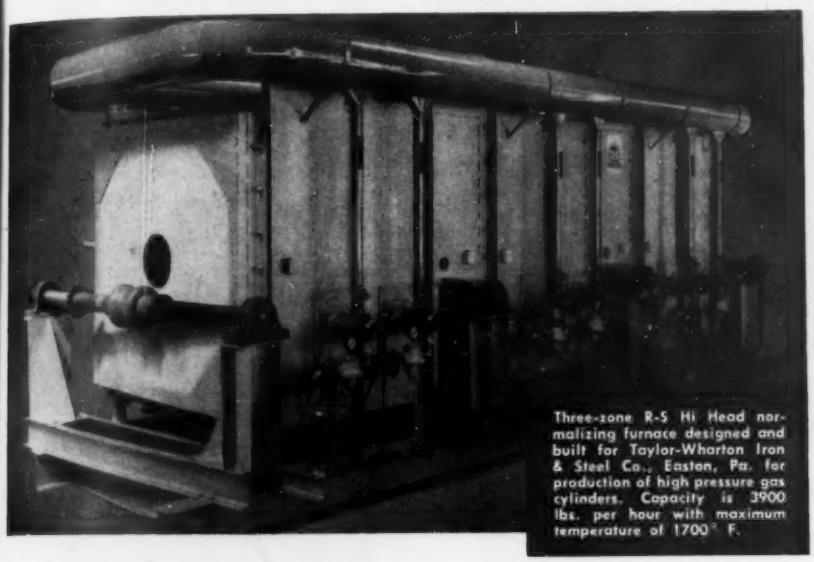


ADJUSTMENT of idler pulley assembly must be made if idler pulley is wider than contact wheel. This distance is equal to one half the difference in widths.

Remove the idler unit and drill holes for expansion shields or other fasteners appropriate for securing the unit in position. Bolt the unit in position, place the coated abrasive belt over the contact wheel and idler pulley. Adjust the tension and tracking controls.

Many times operating conditions dictate that the backstand idler pulley be placed either on a wall behind the polishing lathe or on the ceiling. Regardless of idler position, modifications of this procedure can be adapted to specific requirements of a particular installation.



Three-zone R-S Hi Head normalizing furnace designed and built for Taylor-Wharton Iron & Steel Co., Easton, Pa. for production of high pressure gas cylinders. Capacity is 3900 lbs. per hour with maximum temperature of 1700° F.

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Rigid Standards are met by the rapid and uniform heating. A steel billet 3½ inches square (regardless of length) can be heated to 2300° F. in 14 minutes with uniform heat conduction to the interior of the billet. The "wrap-around" action of the burning gases at high velocities and the high thermal head produce rapid heat transfer.

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DESIGN:

Diecast heater elements cut production costs.

Savings in both weight and cost have been made possible by switching from sand casting to diecasting in producing interchangeable heater elements. The elements, made for The Electromode Corp. by Precision Castings Co., Inc., cost 52 pct less than the sand cast units and are 3 lb lighter.

Other Design Advantages

Besides lower cost, diecast units require fewer secondary operations, have better finish and better heat distribution. Wall thickness of the 31 fins has been cut in half.

Mounting bosses required at each end of the sand casting have been replaced by four rectangular lugs formed between the outer fins. These are diecast to finished size to mate with punched holes in the sheet metal heater frame. When the two halves of the frame are fastened together, they hold the heater element rigidly between them.

High heat conductivity of the alloy, plus the smoother, thinner fins, improves heat distribution considerably.

Turn Page

INSPECTION:

Use Cobalt 60 to check soundness of welds in structurals.

Huge steel beams of a building were X rayed on the University of Illinois campus recently with an amount of radioactive cobalt so tiny that it was hardly visible to the naked eye.

Safety Measure

X rays were necessary to determine the safety of a 60-ft square underground room that will accommodate about 260 persons who would be endangered if any of the welds in the fabricated steel beams were defective.

No Heavy Equipment Needed

To make such X rays usually involves heavy equipment which is not portable. Use of Cobalt 60, a by-product of atomic activity at Oak Ridge, Tenn.

A truck and a crew of technicians were provided by X ray, Inc., Detroit. An amount of Cobalt 60 weighing less than a gram, but so radioactive that it was carried in two lead containers weighing more than 300 lb was used.

To take the X ray the small capsule of Cobalt 60 was clamped on top of a 1½-in. steel beam and X ray film stuck on the underside of the beam with plain old adhesive tape.

Discover Large Cavity

Only other equipment was a Geiger counter which clicked away with warning of radioactivity. When the film was developed a large cavity was discovered in one of the welded joints of a beam that was to eventually bear the main stress of the building. This weld would have been a weak point in the entire structure.

Chief advantage of the method is elimination of heavy equipment for taking X rays. The present method also considerably widens the range of work which can be inspected.

X-RAY FILM is attached to underside of beam in preparation for inspection of steel.

TINY CAPSULE of cobalt enclosed in small container was attached to top of beam so it could shoot rays through 1½ in. of steel to film below.

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DEBURR
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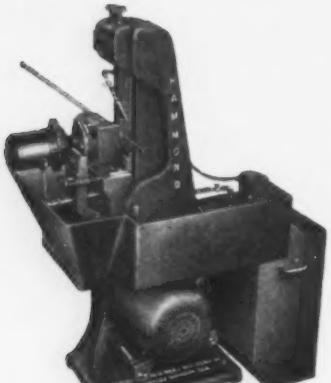

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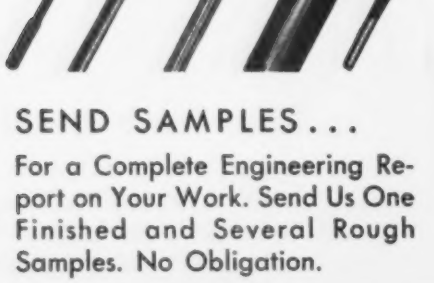

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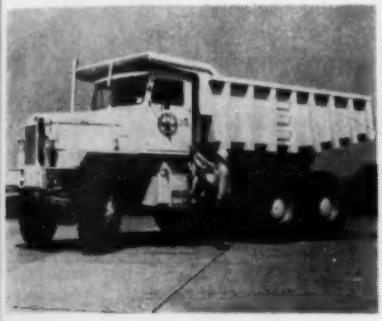
Use Big Trucks to Move Ore

When ore starts moving from pit to railhead at U. S. Steel Corp.'s Orinoco Mining Co., Cerro Bolivar, Venezuela, next January, it will come 35 tons at a clip on huge dump trucks.

Leading from the isolated mountain of high-grade ore are 8 pct grades. Coming downhill under full load presents a special problem for the 16 big (20 cu yd) dump trucks.

Each truck is powered by a 300-hp Cummins diesel engine. To cope with the 8 pct grades, when running downhill under load, twin-disk converters and Parkersburg Hydrotarders are included in the special equipment features of these trucks.



FIRST OF SIXTEEN big Mack dump trucks (each can move 35 tons of ore) which will soon be in service moving iron ore from pit to railhead at the Orinoco Mining Co. operation, Cerro Bolivar, Venezuela.

METAL SAMPLING:

Device takes metallurgical samples from liquid metal.

Successful development of a rotary metal sampling device may do away with drilling operations used in obtaining some metallurgical samples, according to the British Steel Castings Research Assn. The device has possible applications in the steel industry, and in steel and iron foundries.

The device enables furnace samples of steel or other metals to be produced in finely granulated or divided form directly from the liquid state and without the necessity for drilling operations.

The liquid sample is poured on to a rotating copper disk, which centrifugally disperses the metal upon the internal periphery of a surrounding metal bowl.

Prevention of oxidation is necessary during the sampling operation, and is achieved by providing a high purity nitrogen or inert gas atmosphere in the dispersion cavity of the machine. Gas is admitted through a chambered cover-plate, as shown in the accompanying diagram.

Extended field trials upon the Westberg sampling device in its finally developed form have demonstrated the necessary degree of reliability and correlation with analyses performed upon orthodox drilled samples.

This is true not only in respect

Turn Page

NEW SBS WATERLESS WASHSTATION*

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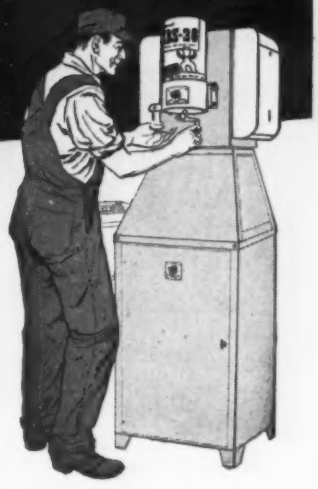

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SBS Waterless Washstations—

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in diameters up to 12 feet

This large spur ring gear has a diameter of 12' 2", with a total of 144 teeth.

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Worm Gears · Racks · Pinions

For big heavy-duty industrial gears, made of all materials, call on Simonds. Backed by a 60-year reputation for dependability, Simonds is equipped right to match your most exacting specifications . . . geared right to give you fast delivery and custom service. Simonds regularly produces spur gears in diameters up to 12', worm gears to 6', bevel and mitre gears to 5'.

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of the normal elements—carbon, sulphur, silicon, phosphorus and manganese—but also in respect of nickel, chromium, molybdenum and tungsten, over a relatively wide range.

Field trials were conducted by the British Steel Castings Research Assn. in conjunction with Westberg Developments Ltd., Rotherham, England.

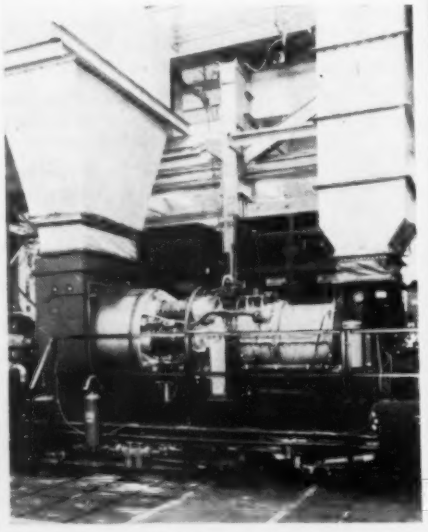
GAS TURBINE:

New 5700-hp unit will drive big 16-stage gas compressor.

A big new gas turbine, one of the first such installations by the petro-chemical industry, has been installed at a major refinery of Esso Standard Oil Co. The new GE, a 5700-hp unit, will drive a three-case, 16-stage Ingersoll Rand centrifugal compressor that compresses hydrocarbon gas from atmospheric pressure to approximately 285 psig.

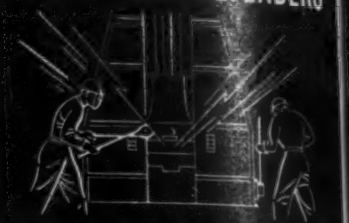
Turbine speed will be controlled throughout the normal operating range of 6400 rpm by means of a pneumatic controller which adjusts a fuel valve to maintain the desired compressor suction pressure.

Using natural gas as its fuel, the GE simple-cycle locomotive-type turbine will exhaust to a waste-heat boiler to produce low-cost process steam.



PRODUCTION MODEL of the locomotive-type, 5700-hp gas turbine on test stand at GE plant. A similar model has been installed at Esso plant to power gas compressor.

M·S·A EAR DEFENDERS



keep harmful noises *out!*

If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing. Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.

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The **Iron Age**

EVERY week and let the

Digest of the Week in Metalworking

help you find your favorite features.

IT PAYS TO READ IRON AGE ADS TOO!

THE IRON AGE SUMMARY...

- **Record production, sales, shipments raise earnings**
- **Earnings should continue high in first half of '54**
- **Steelmaking operations dip one point to 93.0 pct.**

The steel industry earned more than twice as much (100.8 pct more) profit in third quarter 1953 as it did in third quarter 1952. The industry's earnings for the first 9 months of this year are 86 pct higher than they were during the first 9 months of 1952.

The brighter profit picture is revealed by a compilation of steel company financial reports just completed by THE IRON AGE. Included in the compilation are 21 companies accounting for about 90 pct of the industry's ingot capacity.

Alltime records established in production, sales, and shipments this year made the higher earnings possible. Operations last year were handicapped by a 54-day strike during June and July.

But the 1953 profit rise is still a significant achievement—even when compared with earnings during the 1951 boom, when previous production, sales and shipment records were established. The industry's third quarter 1953 profits were 49.1 pct higher than third quarter 1951. For the first 9 months of this year earnings were 14.3 pct higher than for the similar period during 1951.

Earnings next year should continue good for two reasons: First, demand for steel products will continue high—at least during the first half. Second, the excess profits tax is expected to be allowed to expire at year's end.

A specific example shows how much profit windfall companies might expect from expiration of excess profits tax. Of $144 million provided for federal taxes by a large steel producer during the first 9 months of this year, $26.7 million were for excess profits tax.

But labor will be after a bigger share of steel revenue early next year. Most wage contracts in the industry expire June 30. And the United Steelworkers of America has already indicated it will be driving hard for bigger pensions, more social insurance, higher pay, and some form of guaranteed annual wage.

The producers are optimistic over business prospects for the remainder of the year. Some are even more optimistic for the first quarter of next year. Companies in the best position are those with flexible finishing facilities, total capacity of which exceeds their ingot capacity. Such companies are diverting ingot production into products in strongest demand. Result is that they expect to keep operations close to capacity, even though demand for some products has admittedly fallen.

Still in good demand are hot-rolled bars, light plates, structurals, sheets, and oil country goods. Merchant wire products are picking up a little, and mills expect a further shot in the arm early next year. Tinplate, which sagged badly after record buying early this year, is expected to pick up again in December and continue briskly into next year.

Auto buying is expected to spurt in first quarter. And railroad steel orders are likely to be higher in 1954 than they were in 1953. One large railroad has already placed an order for one-third more rails in 1954 than it bought this year.

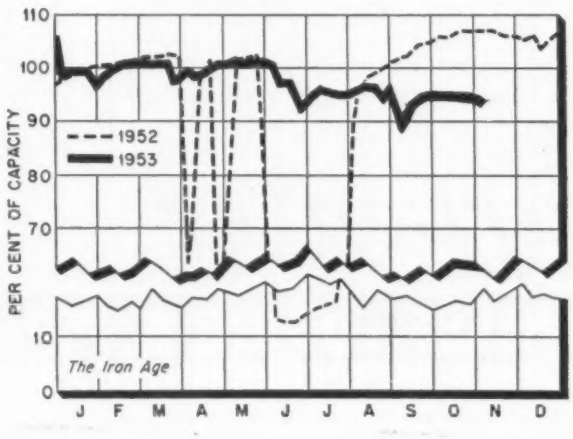
Order cancellations are declining. Some firms that cancelled steel orders are already coming back into the market for tonnage.

Steel Operating Rates

	Week of Nov. 1	Week of Oct. 2		Week of Nov. 1	Week of Oct. 25
Pittsburgh	93.0	97.0*	Detroit	98.0	90.0*
Chicago	98.5	98.0*	Birmingham	96.5	96.5
Philadelphia	95.0	93.0	Wheeling	101.0	102.0*
Valley	95.0	96.0*	S. Ohio River	78.5	81.0
West	95.0	98.0*	St. Louis	89.0	95.5
Cleveland	94.0	97.0	East	88.0	88.0
Buffalo	106.5	106.5	**AGGREGATE**	**93.0**	**94.0**

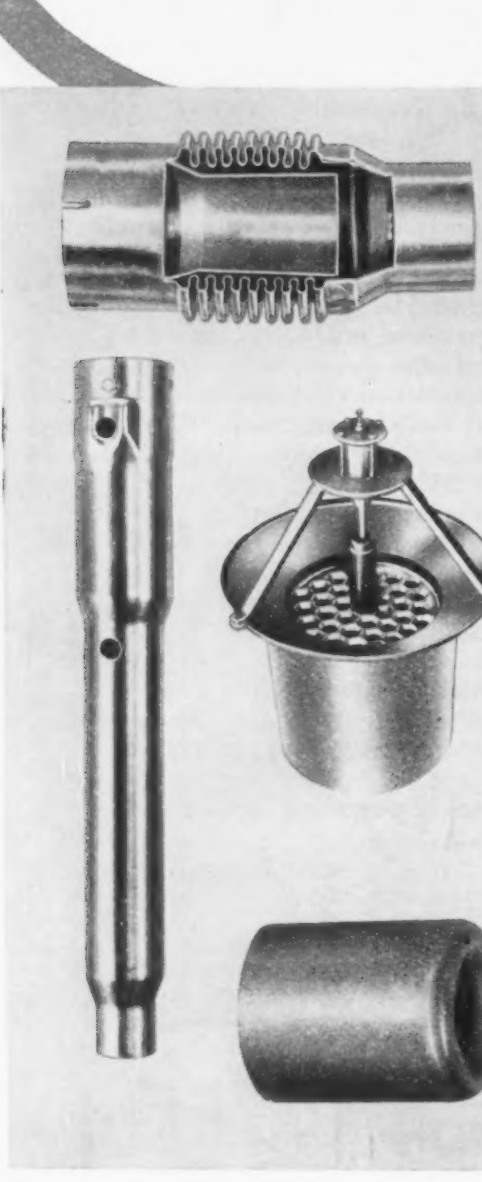
Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised



STEEL OUTLOOK — STEEL OUTLOOK — STEEL OUTLOOK — STEEL OUTLOOK

How to Design for More Product Efficiency



In the column at the left you'll see a few parts that may help you in your next design job. They demonstrate, somewhat, the possibilities of "design freedom" that come when you design with Carpenter Stainless Tubing in mind, because they show that modification of design to achieve economical working or fabrication is unnecessary when you specify "Carpenter".

In short, Carpenter stainless gives you those working properties that make for easy fabrication and low reject rate even when severe drawing, swaging, flanging or upsetting are required. In addition, Carpenter is delivered "as specified" in analysis, dimension, finish, tolerance and temper, piece after piece, order after order. It does not vary in quality.

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Markets at a Glance

Steel Users Have New Sales Angle . . . Sign of continued easing of the steel market is report that some steel users are seeking reciprocal purchasing deals with the mills. A consumer who knows the steel product he is after is in good supply may suggest that the mill reciprocate by buying some of his products such as electric motors, paper clips or whatever else he makes that the mill might be able to use. Aware that the steel buyer can place his order elsewhere, the mills are frequently inclined to go along with the idea.

Expect Steel Order Carryover . . . While hot-rolled sheet is in good supply, at least one midwestern mill says it will be booked solid through the first quarter on plate, structurals, and cold-rolled sheet, could even have some carryovers from the fourth quarter into the first since their cancellations are down.

Pacific Gas Project Will Cost $4 Million More . . . Rise in the cost of pipe since the beginning of the year is largely responsible for the $4 million increase in the estimated cost of bringing natural gas to the Pacific Northwest. Pacific Northwest Pipeline Corp. told Federal Power Commission it will have to spend $145,362,496 to run a 2000-mile line from its fields in New Mexico and Colorado to the Pacific Northwest.

Shutdown Openhearths . . . Slowing demand for tinplate caused Jones & Laughlin Steel Corp. to shut down five of its openhearth furnaces earlier this week. Similarly, Youngstown Sheet & Tube closed down two of its openhearths because of high inventories of semi-finished steel.

Predicts Warehouse Prosperity . . . Sustained good business to April of next year and a drop in warehouse sales of not more than 10 pct from present levels for the whole of 1954 was forecast by Walter S. Doxsey, president, American Steel Warehouse Assn. Steel now on order or at the mills will bring warehouse stocks back to pre-Korean levels, he said.

Strike Ends . . . Six-day strike of steelworkers at Alan Wood Steel Co., Conshohocken, Pa., ended earlier this week. The work stoppage which involved approximately 700 workers was called off when employees agreed to settle their dispute on discharge policy through regular grievance procedures.

Lower Coil, Sheet Prices . . . Newport Steel Corp., Newport, Ky., has reduced the price of its hot-rolled steel coils and sheets to $3.925 per 100 lb f.o.b. Wilder or Newport, Ky. The company also reports its new continuous pickling and slitting line is in operation.

Polish-Red China Trade Mounts . . . Volume of trade between Poland and Red China is now six times greater than in 1950. Shipments of capital goods ranging from iron and steel products to complete industrial plants account for 75 pct of Poland's exports to China. Agreement signed last May between the two countries is expected to result in even more trade in the future.

Cut Stainless Price . . . Western warehouses last week cut prices on Type 430 (straight chrome) stainless sheets. New prices are between 5¢ and 10¢ less per lb. Stainless is being quoted at $47 per 100 lb f.o.b. warehouse in 500-lb lots with a No. 2-D finish, and at $47.15 for No. 4 finish.

Release Nuclear Reactor Patent . . . Atomic Energy Commission this week made available to industry one of its key patents on nuclear reactors. If legislation now pending wins congressional approval, industry will be able to proceed with its own atomic power projects and would be able to make use of this patent.

Scrap Still Rebounding . . . For the fourth week in a row, the steel scrap market firmed. THE IRON AGE Steel Scrap Composite rose $1.16 to $35.33.

Prices At A Glance

(cents per lb unless otherwise noted)

Composite Prices	This Week	Last Week	Month Ago	Year Ago
Finished Steel, base	4.634	4.634	4.634	4.376
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$55.26
Scrap, No. 1 hvy. (gross ton)	$35.33	$34.17	$31.33	$42.00
Nonferrous Metals				
Aluminum, ingot	21.50	21.50	21.50	20.00
Copper, electrolytic	29.75	29.75	29.50	24.50
Lead, St. Louis	13.30	13.30	13.30	13.80
Magnesium, ingot	27.00	27.00	27.00	24.50
Nickel, electrolytic	63.08	63.08	63.08	59.58
Tin, Straits, N. Y.	81.50	81.00	82.25	$1.21⅛
Zinc, E. St. Louis	10.00	10.00	10.00	12.50

Chile Copper Report Goes Unconfirmed

Rumors on status of U. S.—Chilean copper talks abound . . . Dow Chemical's big magnesium rolling mill now operating . . . Firth Sterling adding zirconium—By *R. L. Hatschek.*

Rumors, unconfirmed reports and general mutterings on the status of U. S. dealings for the Chilean copper surplus continue to abound. Latest one is a press report from Santiago stating that the Chilean Senate would go into secret session this week with the finance minister. Aim of the meeting is reportedly to weigh an American offer for the copper.

The report states that the offer covers 150,000 tons of copper, of which 100,000 tons is already supposed to be in the U. S., the rest still in Chile. Price mentioned was 28¢ f.o.b. Chilean ports—about equivalent to 29¢ delivered in this country—for the 100,000 tons, with the other 50,000 tons going at price at time of shipment.

It must be stressed that this was not confirmed in Washington.

Ask Output Cut . . . Chile will also ask Anaconda Copper Mining Co. and Kennecott Copper Co. to curtail production of the red metal, according to the report. A minimum selling price is said to be another request of the South American nation.

With the market running pretty steadily in the U. S. despite the lack of Chilean copper, it would seem that any realistic floor would have to be below the current market level. Unless this were the case, the copper situation would merely be back in the position where nobody wanted high-priced Chilean metal.

Aluminum Ingot Up . . . After touching bottom a week or so ago, prices for secondary aluminum ingot edged upward last week. So did ingot makers' buying prices for scrap aluminum. The ingot rise was about ½¢ per lb in most areas while scrap buying prices are as much as 1½¢ per lb higher this week.

Good quantities of scrap moving for export at high prices were at the root of the increase, according to some members of the trade. At the new domestic prices scrap is beginning to come out in better volume and trade circles anticipate the market stabilizing at these levels.

Growing Competition . . . The U. N. Economic Commission for Europe is concerned with growing competition steel is getting from other materials—notably aluminum. This was discussed at Geneva by steel experts from a dozen European nations as well as the U. S. and Canada. A study is being prepared.

Rolling At Last . . . After much trouble and many delays, Dow Chemical Co. has its new 84-in. reversing breakdown coil mill at Madison, Ill., in actual operation. The announcement was made by Dr. J. D. Hanawalt, vice-president and manager of the firm's Magnesium Div., at this week's Ninth Annual Meeting of the Magnesium Assn.

The first high-speed, high-production mill for magnesium, it is rolling 6-ft wide plate in lengths up to 60 ft. Ingots weighing 2000 lb are used as compared to the 350-lb maximum ingots rolled previously on hand mills.

Soon Hit Stride . . . Also in operation at Madison are continuous casting units for production of rolling ingots and extrusion billets. Full operation is set for early in 1954 and the firm is hoping that economies of the operation will permit eventual price reductions.

New Zirconium Facilities . . . Firth Sterling, Inc., is installing equipment at its Trafford, Pa., plant for the melting and rolling of commercially pure zirconium and zirconium alloys. Vacuum melting furnaces with annual capacity of 360,000 lb will convert sponge to ingots. Initial operation is scheduled for this year.

These will be converted into billets, bars, rods, strip, sheets, wire and tubing for sale to industry.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in October, based on quotations appearing in THE IRON AGE were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	29.606
Lake Copper, delivered	30.125
Straits tin, New York	80.857
Zinc, East St. Louis	10.00
Zinc, New York	10.50
Lead, St. Louis	13.30
Lead, New York	13.50

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Oct. 28	Oct. 29	Oct. 30	Oct. 31	Nov. 2	Nov. 3
Copper, electro, Conn.	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00	29.50–30.00
Copper, Lake delivered	30.125	30.125	30.125	30.125	30.125	30.125
Tin, Straits, New York	81.25	82.25	82.00	....	81.50	81.50*
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10.00	10.00
Lead, St. Louis	13.30	13.30	13.30	13.30	13.30	13.30

Note: Quotations are going prices
*Tentative

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• METALLIC RESIDUES
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Market Muscles Growing Stronger

Further price increases, healthier market tone reported in most districts . . . New strength in turnings, cast grades reflects general improvement . . . Biggest gains on East Coast.

Recent gains in the scrap market's condition were further solidified this week as nearly all districts reported higher prices, improved outlook. One major indication of the market's firmness came when turnings and cast grades, sluggish for some time, strengthened in several districts.

Practically everyone in the trade expected the market to either hold present levels or go higher. Detroit had been a little queasy, but out-of-district demand ultimately bolstered optimism in that area. Even the South, not yet too much affected by recent price rises, expected to be in better health soon.

Biggest gains came in the East, where new buying by a major mill consumer boosted prices on No. 2 steel and bundles as much as $3. No. 1 steel also rose in sympathy, but trade sources felt purchasers were putting major emphasis on boosting quality of No. 2 steelmaking grades. Export talk continues, but, in the words of one broker, "It's just a lot of smoke so far."

THE IRON AGE Scrap Composite rose $1.16 from last week's $34.17 to $35.33 this week.

Pittsburgh—A purchase for a district consumer confirmed prevailing prices for openhearth scrap this week. Approximately 10,000 tons of No. 1 and No. 2 heavy melting and No. 2 bundles were involved in the deal. The market appeared to be approaching stabilization after several weeks of wide fluctuation. Blast furnace scrap is stronger. Cast, also, is showing strength.

Chicago—With a good deal of broker-dealer exchange going on, the Chicago market was relatively quiet last week from a consumer standpoint. Electric furnace prices and rail prices were on the rise. In other grades, dealers were looking for better prices with the result that some broker buying prices were edging up and scrap wasn't easy to get in quantity even with new consumer orders down. Consensus of opinion is that the market will hold or rise, particularly in view of scrap activity in the East and South. Turnings were a little shakey despite the general tone of optimism.

Philadelphia — New buying of a healthy tonnage of No. 2 steel and No. 2 bundles has pushed prices on those grades $3 higher. No. 1 grades are up in sympathy although there is almost no pressure for them. Export business has not touched this market directly but secondary effect is of definite strengthening. Some cast grades and turnings edged higher this week on new business.

New York—Purchases by a major mill consumer raised No. 2 steel and bundles $2 per ton. No. 1 steel is up $1 in sympathy. The turnings market strengthened, with prices up about $1 across the board. Buying by a district foundry raised unstripped motor blocks $2, with other cast grades reflecting the sale by increasing about $1. Mills have served notice of stiffer inspection on No. 2 steelmaking grades.

Detroit—Prices were slow to climb until out-of-district prices edged high enough to draw scrap out of Detroit. No. 1 grades moved up slightly and some high prices paid for turnings for Lake shipment to Buffalo stimulated that market, although perhaps only briefly.

Cleveland—Local consumers aren't showing any interest in scrap but market is stronger since No. 2 steel bounced back in the Valley last week. Prices remained unchanged. Dealer scrap is moving more freely than it was 2 weeks ago and brokers are having no difficulty in covering recent orders. In some instances plant scrap is commanding premium prices which outstrip open market quotations. Low phos advanced $1 in the Valley on the basis of a sale.

Cincinnati — Blast furnace grades edged up $1 on appraisal as both dealers and brokers expected increased activity in the turnings market. Openhearth prices were static. Scrap continues to move out of district by rail and barge because local consumption is at a standstill. Firmer tone in rails was reflected in 18-in. crops which moved from $48.50 to $49 delivered.

St. Louis—Higher prices set by brokers stimulated the movement of scrap from local areas to St. Louis market but did not budge remote scrap. Buying by consumers was only sporadic as inventories remained fat. Some broker prices were reduced.

Birmingham — Although southern scrap dealers and brokers have a feeling of market strength as a result of recent price increases by northern mills, it has not been reflected in buying by mills in this area. Prices are unchanged except a $1 rise in angles and splice bars. Cast is tight and foundries are reported offering a $2 premium for No. 1 casts and stove plate from west of the Mississippi River and north of the Ohio River. Shipments from the Southeast are unaffected, however.

Buffalo—Wide buying interest has boosted scrap prices here $1 to $3 per ton. Two leading mill consumers reentered the market with substantial new orders raising steelmaking grades $1 a ton. Machine shop turnings were up $3. New business in low phos was reported with prices $1 higher. Market sentiment is decidedly better.

Boston—Considerably better sentiment in this market is reflected by increased prices for most grades of scrap this week. And the trade, now optimistic, is expecting further increases. Feeling today is that the rough times are over.

West Coast—November prices are expected to be unchanged from October but tonnages reduced. No actual export licenses reported yet although authorized.

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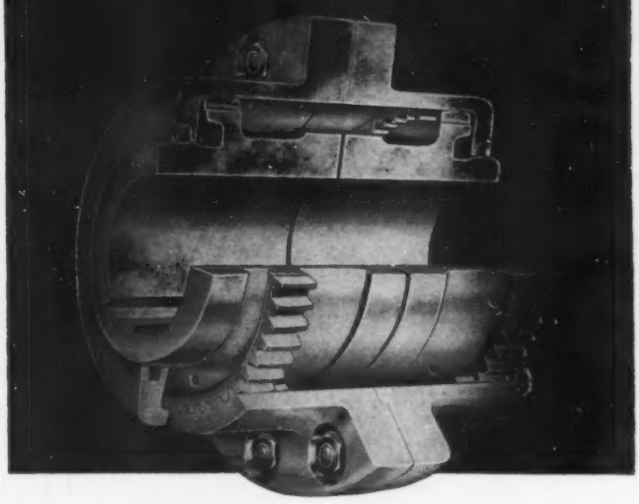

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1	940	Whse.	GM	250	140/170
1	800	Whse.		250	450/550
1	225	Whse.		250	95/190
2	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	300/900
2	450	Whse.		250	415
1	400	G.E.	MCF	550	300/1050
2	300	Whse.	CB-5094	250	575/1150
1	200/300	G.E.	MPC	230	380/920
1	200	Rel.	1976T	230	720
1	200	Whse.	CB-5118	250	480/900
1	150	G.E.		600	250/750
1	150	Cr. Wh.	85H	230	1150
8	150	Cr. Wh.	83H-TEFC	230	900
1	150	Whse.	8K-151B	230	900/1800
1	150	Whse.	8K-301	230	380/950
1	50/120	G.E.	MCF	230	250/1000
2	100	Whse.	8K-181	230	450/1000
1	100	G.E.	CDP-115	230	1750

MILL & CRANE

1	50	G.E.	CO-1810	220	725
1	20	Whse.	K-5	220	975
4	15	Whse.	K-5	220	650
3	10	C.W.	8CM-AH	220	1150
1	10	G.E.	MD-104	230	400/800
3	8.25	Whse.	K-3	220	600
4	3	C.W.	8CM-FF	230	1750
3	3	Whse.	HK-2	230	835

A.C. MOTORS

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1500	G.E	MT-498	2300	360
1	1500	ABB		2300	720
1	1200	G.E.	MT	2300	275
2	1000	A.C.	Mill	2300	240
1	500	Whse.	CW	550	350
1	500	G.E.	I-M	2300	900
1	400	Whse.	CW	440	514
1	400	Whse.	CW-1218	2200	435
1	350	G.E.	MT-442Y	2300/4000	253
2	300	G.E.	MT-565Y	2300	900
1	250	G.E.	MT-424-Y	4000	257
1	250	G.E.	MT-559S	2200	1800
1	250	Al. Ch.		550	600
1	200	Cr. Wh.	26QB	440	505
1	200	G.E.	IM-16	440	600
1	200	G.E.	IM	440	435
1	200	G.E.	MTP	440	1170
1	150(unused)	Whse.	CW	2300	435
1	150	G.E.	IM-16	440	600
2	125	A.C.		440	905
1	125	Al. Ch.		440	720
4	125	G.E.	MT-566Y	440/2200	435
1	100	G.E.	IM	440	600
5	100	A.C.	ANY	440	695
1	100	G.E.	IM-16	2200	435
1	100	Whse.	CW-868A	440	700

SQUIRREL CAGE

2	650	G.E.	FT-559BY	440	8570
2	450	Whse.	CS-1439	2300/4150	354
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150	Whse.	CS-8568	440	880
1	150	Whse.	CS	440	580
1	150/75	G.E.	IK	440	900/450
2	125	Al. Ch.	ARW	2200	1750
1	125	Whse.	MR	440	485

SYNCHRONOUS

2	3500	G.E.	TS	2300	257
2	2100	G.E.	ATI	2300	340
2	1750	G.E.	ATI	2300	3600
2	2000	Whse.		2300	120
2	735	G.E.	ATI	2300/12000	600
1	450	Whse.		2200	450
2	850	G.E.	TS	2300	156

M-G Sets—3 Ph, 60 Cy

Qu.	K.W.	Make	RPM	D.C. Volts	A.C. Volts
2	2000/2400	G.E.	450	250/300	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	2000	G.E.	500	25eg 600	11000
2	2000	G.E.	514	600	6600/13200
2	1500	G.E.	514	250	6600/13200
1	1500	G.E.	720	600	6600/13200
1	1500	G.E.	600	600	4160
1	1500	C.W.	514	30/115	4000/13000
2	1000	Whse.	900	600	4160
1	1000	G.E.	900	280	6600
1	1000(SU)	G.E.	900	250	2200
1	750	Whse.	900	275	4160
1	750	C.W.	514	30/115	2300
1	600	G.E.	720	250	440/2300
1	500	G.E.	720	125	2300
1	500	Whse.	900	125/250	440
1	500	Whse.	1200	125/250	2300
1	400(SU)	Cr. Wh.	1200	125/250	2300
1	150	Whse.	1200	275	2300
1	140(SU)	Cr. Wh.	690	125/250	440/2300
1	100	G.E.	1200	250	2300/4000
1	100	G.E.	1170	125	220/440

FREQUENCY CHANGER SETS

Qu.	KW	Make	Freq.	Voltages
1	12500	Whse.	25/60	13200/13200
1	3000	G.E.	25/60	2300/2300/4000
3	2500	G.E	25/62.5	2300/2300
1	1000	G.E.	25/58.3	4400/2300
1	500	Al. Ch.	2560	11000/2300

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

The Clearing House

NEWS OF USED AND REBUILT MACHINERY

Adjusted to Slump . . . Detroit dealers with long established reputations for servicing customers with used and rebuilt machinery aren't panic stricken by their current recession but they are unanimous in admitting that there is one.

The July-August slump in used machinery was expected, but what has dealers scratching their heads is the disappearance of the upsurge that always comes in September and October.

They Were Duds . . . Some signs of a slight pickup have been noticed in the last week or two, but the trade won't be able to forget that almost two of the best business months of the year turned out to be complete duds as far as sales go.

Most experienced dealers aren't losing sleep over market conditions, however. They look forward to getting back to so-called normal conditions when they will again be able to accumulate respectable inventories which will enable them to meet all their customers' needs.

They believe the used machinery business should return to a level where dealers can obtain good equipment at reasonable prices and, by reputation and knowledge of the market, find buyers for it.

Can't Get Tools . . . One major Detroit dealer whose operations extend over a wide area of the country recalls that in the pre-Korea days his firm frequently outfitted an entire new shop, a feat which is out of the question even in today's easing market. There still aren't enough good quality tools available and it is virtually impossible to build up substantial inventories of desirable machinery.

This dealer points out that his firm formerly enjoyed a steadier market and that its reputation for reliability was more of an asset then than it has been in recent years.

What's Moving? . . . Generally, Detroit dealers report that special purpose tools are not moving. Only versatile general purpose tools appear to be in demand.

However, one of the most successful dealers in the area reports his firm is nevertheless concentrating on special purpose tools. His sales staff with its contacts and collective knowledge of the market is able to find out where special purpose tools are needed and is able to supply them without forcing the buyer to shop all over the Midwest for the right piece of equipment.

Why Join a Trade Group? . . . One of the many advantages of belonging to a trade association, the assistance that is frequently given by members in times of emergency, is pointed up by Fred Wipperman, executive secretary, National Industrial Service Assn., in the October issue of *NISA News*.

Commenting on fires which recently destroyed two electrical equipment repair shops, Mr. Wipperman stated that the owners of these NISA member shops told him they would have been forced out of business if it hadn't been for the help given by other association members. Both firms were able to use shop space and repair facilities of other local NISA member shops until their own fire-gutted shops were restored.

Up for Sale . . . Dealers and manufacturers in the New England area will have an opportunity to attend an auction sale of the machinery and plant of the Baker Refrigeration Co., South Windham, Me., on Nov. 12. Included in the equipment being offered for sale is an extensive line of machine tools such as horizontal and universal milling machines, engine, toolroom and turret lathes, boremetics and grinders.

Plant and equipment may be inspected from Nov. 7 to sale date.